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SOME PHASES OF EXPERIMENTAL SYPHILIS

WITH SPECIAL REFERENCE TO THE QUESTION OF STRAINS *

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As a result of the rather intensive study of syphilis during the past few years, experimental methods of investigation of this disease have been evolved and our fund of information has been increased thereby.

It is believed that the results to be obtained from a study of experimental syphilis will be far greater if the human factor is brought into the equation. We cannot very well draw comparative conclusions as to the behavior of nervous syphilis in the rabbit, unless we know that the strain in question does and has produced nervous involvement in the human being. The end for which we have worked is the determination in the rabbit of the various characteristics and peculiarities of the initial lesion and subsequent course of the disease, with strains of syphilis known to have produced nervous syphilis in the human being, compared with other strains known to run a mild course and readily amenable to treatment in the human being. This paper is based on the results of six years' work, during which time twenty strains have been observed in the rabbit, of which number only a few have been carefully studied over a prolonged period of time.

Fig. 1.—No. 5 lesion involving testicle, tunic and skin.

Two of these strains were obtained from the spinal fluid of patients having nervous syphilis.

During the year 1910, while at the Rockefeller Institute, Nichols began the study of experimental syphilis in the rabbit. This work has been carried on continuously until the present time, four years by Nichols and the remainder of the time by me, and now serves as the basis of this paper. The first part of Nichols' work was performed with strains obtained from mucous patches and chancres. June 30, 1912, he, in company with Dr. William H. Hough[6] of this city, injected spinal fluid from a neurorecidiv into the testicles of a rabbit. A lesion appeared at the end of fifty days.

This strain during the last four years has been studied by us in seventy-three rabbits in thirty-two generations. This strain is of particular interest, as it was in the eleventh rabbit in the seventh generation that there was demonstrated and confirmed by Green and Nichols the presence of a definite fundus involvement. As will be noted in the table, this strain has characteristics not noted in any other of those studied.

Chancre Strain 10 was obtained from the serum of a rather large, only moderately indurated chancre. Both man and wife showed a tendency toward mucous lesions, and the wife, who went a few weeks longer without treatment, presented a few roseolas. Both responded readily to treatment, showing that their syphilis was not of an intractable type and they are now in a condition closely approximating that of cure. The type of manifestations produced in the rabbit will be seen in the table.

Chancre Strain 7 was obtained by Capt. Clarence L. Cole, Medical Corps, U. S. Army, at San Antonio, Texas, Oct. 21, 1913, from the initial lesion of a soldier.

Chancre Strain 11 was obtained Jan. 19, 1915, from the chancre serum of a patient having a large indurated lesion. At the end of two months there was observed in the rabbit an anterior eye chamber involvement

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Continuing certain investigations initiated by Capt. H. J. Nichols, Medical Corps, U. S. Army, in the Department of Pathology at the Army Medical School.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on request.

* This article and the one by Dr. Cole which follows are parts of a symposium on "Syphilis." The remaining papers by Drs. Sutton, Wile and Elliott, Schamberg, Kolmer and Raiziss, Trimble and Rothwell, and Irvine and the discussion will appear in THE JOURNAL for December 23 and 30.

6. Nichols, H. J., and Hough, W. B.: Demonstration of Spirochaeta Pallida in the Cerebrospinal Fluid, THE JOURNAL A. M. A., Jan. 11, 1913, p. 108.

accompanied by a marked bilateral keratitis. Evidently a cyclitis was also present, as soon after there developed a cataract in both eyes. The same condition developed later in another rabbit. So far as is known, this lesion has not been observed by others. This patient died as a result of gas asphyxiation, and it was not possible to follow him further. The manifestations produced in the rabbit are noted in the table.

Fig. 2.—Diffuse orchitis characteristic of Strain 10.

Spinal Fluid Strain 19 has been reported.[8] This patient died at the end of ten and one-half months from cerebral syphilis in spite of what might be termed average treatment. The rabbit was inoculated from the spinal fluid. Two other cases contracted from the same source are now under observation.

In all, twenty successful inoculations have been made, ten by Nichols and ten by myself. In the ten observed by Nichols, nothing unusual was noted except in Strains 5 and 7. Excepting Strain 5, all the successful inoculations studied by Nichols were obtained from chancres or mucous lesions. Of the ten successful inoculations seen by me, all but Strain 19 were obtained from the chancres or mucous lesions, and only Strains 11 and 19 presented unusual manifestations. Strain 26, obtained from an extragenital lesion on the face, could not be differentiated in any way from Strain 10. Owing to the lack of room and the difficulty in obtaining animals, these other inoculations have not for the most part been carried through more than one or two rabbits.

TYPES OF LESIONS

It has seemed desirable to adopt a classification of types of testicular lesions observed in the rabbit, which is slightly different from that observed by Uhlenhuth and Mulzer.[5] (For want of space, this will not appear except in the reprints.)

It is believed that an accurate and standard technic for inoculations is an important part of this work. In performing testicular inoculations from chancres, clean and wash well with normal salt solution, have patient squeeze chancre, and obtain characteristic serum in capillary pipet. Mix with normal salt solution and inject not more than 0.3 c.c. into testicle of rabbit, first cleansing the skin. Successful inoculation seems rare with secondary infection. To transfer from rabbit to rabbit, dip tip of capillary pipet in 1 per cent. sodium citrate and carry into testicle with boring motion. Mix testicular fluid with normal salt solution and inject as before. In an infected testicle negative to dark field, one can remove testicle, make emulsion, strain, and inject as before. Do not inject large quantities, as this predisposes to trauma and secondary infection. It is necessary to differentiate between secondary infection and sterile central necrosis which follows the initial lesion with some strains. Adult rabbits with well formed testicles should be used. Steiner[9] prefers white rabbits for study of nervous lesions, but they are not so good for the study of eye lesions. It is best except in first inoculation from human being to determine lesion by palpation. Some types of lesions are not readily palpable. Repeated punctures for dark field examination produce trauma and hemorrhage which may cover up the lesion or interfere with development.

CHOROIDITIS AND NEURORETINITIS

The fundus of a rabbit differs considerably from that of the human eye. The blood vessels are not visible, and the construction of the disk is such that the recognition of a choked disk would be impossible. The diagnosis of these conditions in the rabbit is a difficult matter to even an expert ophthalmologist, until he has had considerable experience and is thoroughly acquainted with the normal rabbit fundus and the character of the lesions to be expected; and even then, difficulty is often experienced. Confusion may arise from unusual forms of pigmentation as well as the peculiar arrangement of the medullated nerve fibers. The choroidal manifestations appear usually in the lower quadrant as yellowish, granular spots which later may become pigmented. There may be only a few of these spots, small in size, and they may not be

Fig. 3.—Multinodular, indurated orchitis of No. 11.

readily recognizable or they may be large enough to be easily seen or the condition may become fairly diffuse, as in one case which closely simulated an albuminuric retinitis. Later these spots become atrophic and assume a white, glistening appearance. In one of two attempts, a successful transfer was made with normal salt emulsion of washed choroid. In both cases Strain 5 was used. Microscopic examinations of sec-

8. Reasoner, M. A.: Early Death from Cerebral Syphilis, with Successful Rabbit Inoculation, The Journal A. M. A., June 17, 1916, p. 1917.

9. Steiner: Neurol. Centralbl., 1914, xxxiii, 546.

tions of fundus show the presence of syphilitic processes. At a later date we shall collaborate with Dr. Louis Green in a more detailed presentation of this phase of the subject.

Keratitis and Pericorneal Injections.—In Strains 5, 7, 11 and 19, an occasional pericorneal injection was noticed following testicular inoculation. This condition most often appeared within two months after the initial lesion, but in several cases it was noticed before the lesion was yet manifest. It starts as a rule in the superior portion of the cornea in the form of a slight haziness. The anterior ciliary vessels are somewhat enlarged and engorged, and spread out as if to encircle the cornea, and the iris is normal. In a few days, vascularization of a deep type takes place, and with the corneal microscope is seen to consist of radial vessels passing down into the cornea (Figs. 4 and 5). In four rabbits, the entire cornea became involved and the characteristic salmon patch was observed. In two rabbits a pericorneal injection was noted (one in Strain 5 and one in Strain 11) without the appearance of the initial lesion in the testicle. Repeated unsuccessful attempts to inoculate these rabbits by way of the testicle caused us to consider the possibility of an infection in these animals without the initial lesion.

With the idea of determining if it were possible to produce fundus lesions with Strain 10, repeated intravenous inoculations of Syphilitic Emulsion 10 were made at weekly intervals after the appearance of the initial lesion. In no case did fundus lesions appear, but it was found that if these inoculations were made within two months from the time of the testicular lesion, a pericorneal injection and in some cases a well-marked keratitis would be induced. In six out of seven rabbits, this was observed after the third inoculation, given at weekly intervals. In the seventh rabbit no effect was observed. If a number of months were allowed to elapse before the intravenous injections were made, no result was observed. The presence of spirochetes in scrapings from the cornea was demonstrated by means of the dark field. In the only case attempted, a successful transfer was made with emulsions of corneal scrapings. Ordinarily these manifestations cleared up within a few weeks. In two Strain 10 rabbits inoculated primarily by intravenous injection, it was not possible to produce this condition. This procedure was then applied to the other strains. The results were not so constant, but when they did appear, resolved more slowly.

Fig. 4.—Pericorneal injection with keratitis.

Cataract.— In one Strain 11 rabbit a typical cataract was observed in both eyes. Evidently this condition had been preceded by a cyclitis. This condition was not observed in any other strain, and so far as is known has not been noted by other observers.

Gumma of the Eye.— One case of gumma of the eye was seen in strain 10. This animal was inoculated in the testicle, and seven weeks after the appearance of the lesion, three intravenous injections of emulsion of syphilitic material were given at weekly intervals. A well-marked keratitis with opacity of the cornea and salmon patches developed in both eyes. The right eye cleared up entirely in two months, but the left eye went on to a gummatous formation involving the ciliary body, iris and lens.

Eyelid Involvement.—As stated above, this condition was observed only in Strain 5. It appeared in three rabbits within from one to three months after a single testicular inoculation. It showed itself as a granulomatous condition, and by dark field, many organisms could be demonstrated. A successful transfer was made from one of these lesions.

Nasal Involvement.—This condition, as observed by Uhlenhuth and Mulzer,[9] we have seen only in Strain 5. It appears late in about 25 per cent. of the rabbits. The organisms can be demonstrated in the nasal discharge.

Paronychia.—This was observed in Strains 5, 10 and 11. The nail beds become involved throughout. Erosions and ulcerations with a whitish discharge were present. In one case the organism was demonstrated.

Lesions of the Penis and Sheath.—These were observed only in Strain 5. They resembled mucous lesions. Organisms were demonstrated.

Inoculations in Various Tissues.—Successful inoculations with resultant lesions were also obtained in the eye and eyebrow. A series of inoculations was then made in other tissues with either Strain 11 or a combination of Strains 5 and 11. In this case, the presence of a successful inoculation could be determined by the presence of fundus lesions or blood transfers and checked up by the failure of later testicular inoculations. As shown by Kolmer and Trist,[10] a certain number of rabbits will show a non-specific complement fixation, and for that reason the Wassermann reaction is not dependable for the determination of infection. In one animal inoculated intramuscularly, the presence of infection was demonstrated by the transfer of the disease through the liver and spleen emulsion. Injections of emulsion of syphilitic material were made intramuscularly, intraperitoneally, intravenously and subcutaneously under the skin of the abdomen, with successful results so far as a general infection was concerned; but in no case was an initial lesion noted. In one rabbit Nichols obtained an initial lesion following a subcutaneous or intradermal inoculation on the inside of the hind leg.

Uhlenhuth and Mulzer, working with young animals, noted that frequently following such inoculations a testicular lesion manifested itself. In my work with adult animals I have not had such results, though Nichols has seen it on two occasions. Two intracranial and one intraspinal inoculations of Strain 5 were made but were not successful. Two animals were inoculated intracranially with Strain 19. One of these animals developed a paralysis of the hind legs at the end of thirty days and was killed. The brain showed evidences of meningitis, which, of course,

10. Kolmer and Trist: Jour. Infect. Dis., 1916, xviii, 20.

need not have been specific. It also showed a focal necrotic lesion in the cortical portion of brain. Emulsion of the brain and cord was used to inoculate other rabbits, with successful results. The other animals developed a general syphilis. Noguchi carried on a series of intracranial and subdural inoculations, as did Swift and Ellis, but were unable to satisfy themselves that the rabbits or monkeys had become infected from a single inoculation. It is interesting to note that with our Strain 19, which had produced a cerebral lesion causing death in the human being, we were able to produce a possible general syphilis from a subdural inoculation.

These conditions might be explained on other grounds. The death of the rabbit, the presence of meningitis, and the existence of the particular lesion noted do not depend solely on the presence of a syphilitic process. The explanation of the transfer of the disease through brain emulsion is more difficult. Van Zetti[11] has shown that following subdural implantation of small sections of syphilitic material, the organisms may be recovered up to forty days. If we can imagine that these spirochetes remain in the cranial cavity during this time as in an anaerobic culture tube, without producing a syphilitic process, then the transfer of the disease from a nonsyphilitic animal may be admitted to be possible. A similar inoculation performed on another rabbit was not successful. It is not intended to draw general conclusions from this one case, as further work is needed along this line.

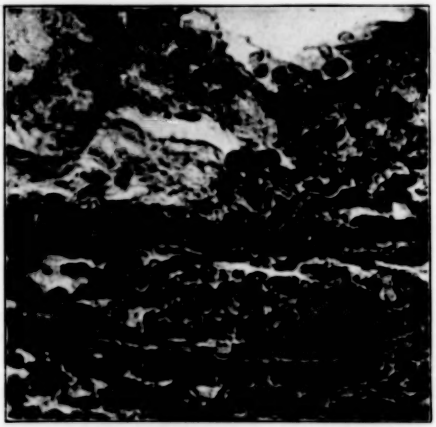

Fig. 6.—Magnification showing meningitis in No. 5/44-4.

We made a brief study of the brains of Animals 5, 10 and 11, which had received repeated intravenous injections following the initial testicular lesion. While our findings were not constant, owing possibly to the fact that complete examinations of the brain tissues were not performed, yet we were able to demonstrate the presence of syphilitic lesions in animals of each of these strains. The following brief descriptions will serve as examples of the conditions found:

No. 5/44-4.—Testicular inoculation successful. During one year, rabbit received eight intravenous inoculations of syphilitic emulsion. At the end of this time, it developed paralysis of hind legs and died. Brain showed marked meningeal involvement and perivascular infiltration (Fig. 6).

No. 11/7-1.—Testicular inoculation successful. During two months the animal received three intravenous inoculations of syphilitic material. At the end of four months the animal died. Brain showed focal lesions with necrotic center evidently vascular in origin, and slight meningeal and blood vessel involvement (Fig. 7).

No. 10/6-6.—In this case, rabbit had received only three intravenous injections of syphilitic emulsion lasting over a period of twenty-two days. At the end of this time the rabbit died. Brain showed marked blood vessel involvement, endarteritis and circumscribed round cell infiltration (Fig. 8). It was something of a surprise to discover such lesions with this strain, as while we do not know that it will not produce nervous lesions in the human being, yet we have seen that in two individuals it was definitely milder in its progress than other strains we have had under observation. It will be conceded, however, that the conditions under which this lesion was obtained are not parallel to those existing in human infection.

No. 11/7-3.—This is one of our most interesting cases of cranial involvement. This animal received three injections of syphilitic emulsion under the skin of the abdomen, during a period of four months. It then received a testicular inoculation and died at the end of one month. The testicles were negative to microscopic examination, as was to be expected. The brain showed several pronounced focal lesions in the cortical region with marked plasma cell and lymphocyte proliferation, also mild periarteritis and meningeal involvement.

A logical interpretation of these findings in the light of our personal belief in the strain theory must needs await a longer period of study of the infected animals and their nervous lesions as well as the human beings from whom the strains were obtained, reinforced when possible with findings from other observers.

Removal of Testicles Before the Appearance of Lesion.—In two animals, the inoculated testicles were removed at the end of seven days, and in one animal at the end of thirteen days, without a resultant generalized infection. In another animal, generalized infection followed the removal of inoculated testicle at the end of twenty days. It was found possible in one case to transmit the disease with defibrinated blood seventeen days before the lesion could be palpated.

Removal of Testicle After the Appearance of the Initial Lesion.— In working with Strain 5 which has something of a tendency toward metastatic involvement of the uninoculated testicle, Nichols was able to demonstrate that this tendency is increased by removal of the inoculated testicle as soon as the lesion appears. He has suggested this[15] as having some possible bearing in the case of neurorecidivs.

The Effect of Heat on Spirochetes.—At the suggestion of Major E. R. Whitmore, rabbits were inoculated with heated syphilitic emulsion. In the first series, three rabbits were inoculated with emulsion heated for five minutes at 55 C. In the second series, three rabbits were inoculated with syphilitic emulsion heated for five minutes at 50 C. In all six rabbits the results were negative.

Viability of Spirochetes in Tissues at Room Temperature.—A testicle richly infected with Strain 10 was removed and

11. Van Zetti: Pathologica, 1912, No. 83; Arch. de biologia norm. e path., 1913, lxii, Fas. 4, sup.

15. Nichols, H. J.: Observations on the Pathology of Syphilis, The Journal A. M. A., Aug. 8, 1914, p. 466.

kept in a Petri dish at room temperature. Dark field examinations were made at several hour intervals. Motility was observed up to fifty-six hours. At this time a single organism was observed to have slight rotary motion. Others showed varying degrees of degeneration.

Double Inoculations.—A rabbit was inoculated in the right testicle with Emulsion 5 and at the same time in the left testicle with Emulsion 10. A characteristic No. 5 lesion appeared in the right testicle at the end of thirty days. The lesion in the left testicle was somewhat delayed, but when it did appear at the end of seventy days, it was of the No. 10 type and remained so for a month, when it became indurated, as is characteristic of No. 5. A transfer from the left testicle, made at this time, developed characteristic No. 5 lesions. It would seem probable that in the left testicle, at least, there were eventually two strains, No. 5 overshadowing the No. 10.

In a number of trials it was found difficult, once the initial lesion had reached full development, to reinoculate the animal. A series of eight rabbits was inoculated by various methods with Emulsion 10 (which does not produce choroidal lesions), and, after varying periods, received repeated inoculations of Emulsions 5 and 11. Only one of these rabbits showed any trace of choroidal involvement.

This series was suggested by the work of Finger and Landsteiner, who inoculated human subjects during both the secondary and tertiary stages, and with resultant secondary or tertiary lesions, respectively. Further investigations will be carried out along this line. It would seem probable that when once the disease has reached its height in the rabbit, there is a considerable amount of protozoal immunity, and this immunity lapses with the passing of the infection. The appearance or nonappearance of an initial lesion might be explained otherwise.

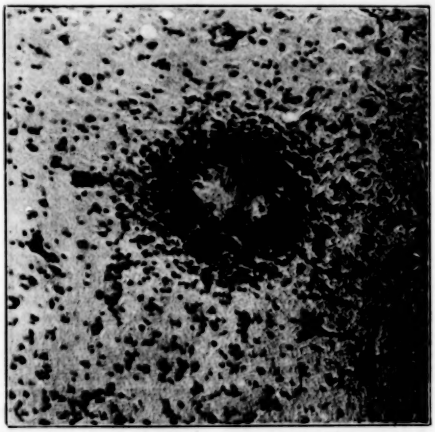

Fig. 7.—Focal lesion with necrotic center in Rabbit 11/7-1.

Levaditi is of the opinion that syphilitic immunity is a condition of a relatively refractory state of the skin and mucous membrane to external spirochetes, thus explaining the inability to produce a second initial lesion in an already infected individual. It would seem more probable that the development of an initial lesion is a power of reaction possessed by certain tissues and is an attempt at defense on the part of these tissues, and soon after the disease becomes generalized, this tissue reaction becomes lost. Certainly the chancre stage is in no way to be considered as an integral or necessary phase of the disease.

It is interesting in this connection to consider the statement made by Hazen[16] that in over 3,000 cases of syphilis seen by him in the colored race, he had seen only three extragenital lesions. So far, I do not know of his statement being controverted by the experience of others. This is not because the negro does not have the disease, nor is it because he is not brought into contact with it. Is it not possible that he may not have outside of the genitalia (as practically exists with the rabbit), the power of tissue defense or reaction to initial syphilitic infection which manifests itself as an initial lesion? Might not the same explanation be invoked in some of the many cases of syphilis we are now finding, whose history of infection is negative to the most searching inquiries?

Infection from Applications to Unbroken Skin and Mucous Membrane.—At the suggestion of Capt. E. B. Vedder, Medical Corps, a series of eight rabbits is now under observation to determine if it is possible to transmit the disease through applications to unbroken skin and mucous membrane. These will be reported later.

A Peculiar Late Testicular Manifestation.—In three rabbits, all of different strains, two inoculated intratesticularly and one intravenously, there appeared peculiar late testicular manifestations; a small hard nodule containing many very slender and long spirochetes. In one case a successful transfer was made and typical organisms reappeared.

Spinal Fluid Inoculations.—Spinal fluid was injected from eight individuals with two successful results. The successful cases are cited above. The unsuccessful cases include one early cerebral syphilis, one old syphilitic hemiplegia and four cases of paresis.

Dr. Wile's[17] *Paretic Strain.* — Through the kindness of Dr. Udo J. Wile, we were supplied with a culture of his paretic strain; but owing probably to the fact that it had been away from the rabbit too long, we were unable to obtain a successful inoculation. It is desired to take this opportunity of expressing an appreciation of the great value of Dr. Wile's work along this particular line.

Variations in Morphology.—With regard to fixed variations in morphology, such as thick and thin strains, I am not prepared to make any statements except that I have not been able to satisfy myself beyond question that such differences do exist.

Alterations of Strains in the Rabbit.— So far we have not been able to recognize any variations in the characteristics of any of the syphilitic strains as a result of prolonged growth in the rabbit.

COMMENT

The question as to whether or not there are variations in strains of syphilis it would seem must be answered in the affirmative. Such work as we have done and such conclusions as we have reached with regard to this point are based primarily on the preliminary work of Noguchi and Nichols[18] and to them is

16. Hazen, H. H.: Syphilis in the American Negro, THE JOURNAL A. M. A., Aug. 8, 1914, p. 463.

17. Wile: Jour. Exper. Med., 1916, xxiii, 199.

18. Nichols and Hough: Footnote 6. Nichols: Footnotes 7 and 15; South. Med. Jour., September, 1912, p. 528. Russell, Craig and Nichols: Bull. 3, Surg.-Gen.'s Office, June, 1913. Noguchi: Jour. Exper. Med., 1912, xv, No. 2.

due the credit for having evolved this fact from experimental work on the rabbit. It is a much more difficult matter to state the significance in the human being of these variations as seen in the rabbit. A rabbit is not a human being, and the methods used in the inoculation and study of the rabbit are not those to which the human being is subjected. On the other hand, if we can find in the rabbit certain manifestations to correspond with types of syphilis in the human being, are we not justified in accepting the analogy, at least until it can be disproved?

We are not yet prepared to assert that nervous involvement in the rabbit runs parallel with the same condition in the human being, as our work along that line has been too limited. It is our opinion that nervous involvement in the human being, so far as the spirochete is concerned, is rather a matter of predilection for certain tissues, or as Nichols believes in the case of nervous involvement, combined with a higher degree of invasiveness. We believe that we have been able to demonstrate these properties in the rabbit. So far as we have been able to observe in one possible and two undoubted strains of nervous syphilis, choroidal involvement in the rabbit is analogous.

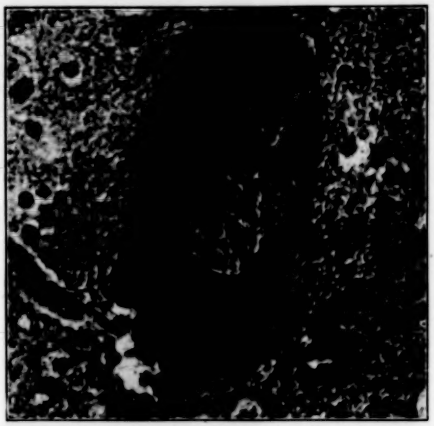

Fig. 8.—Characteristic syphilitic blood vessel involvement in Rabbit 10/6-6.

Weygandt and Jakob[19] state that "we also found that the animals infected with the same strain in some cases developed nervous syphilis and in some cases did not. This militates strongly against the theory of 'virus nerveaux.'" Admitting that they are working with strains of syphilis of the nervous type and that the pathologic processes they describe in the rabbit are analogous to those seen in nervous involvement in the human being, is it not a plausible explanation that if such involvement is due to a high degree of invasiveness or a predilection for certain tissues on the part of that strain, this invasiveness or predilection may be a varying quantity, less noticeable in some strains than in others, and in the milder strains more susceptible to varying individual resistance? In fact, would not this supposition more nearly coincide with the clinical facts with which we are confronted? In potent strains the individual resistance might be of little avail, while in weaker strains it might or might not protect. In other strains, such as those producing tertiary bone involvement, might there not be little tendency toward involvement of the nervous system, such that even those having moderate individual resistance would not be in danger? The variations in the percentage of nervous involvement seen in different epidemics of diphtheria would seem to be a parallel condition.

19. Weygandt and Jakob: Dermat. Wchnschr., 1914, lviii, 150.

CONCLUSIONS

1. We have been able to demonstrate, to our satisfaction, fixed differences in various strains of syphilis as studied in the rabbit. In order to demonstrate these differences, the use of adult rabbits and a standard and proper method of inoculation are necessary.

2. Choroiditis and chorioretinitis have been observed in rabbits inoculated with two different strains of nervous syphilis, and in one strain whose characteristics are not known. In a series of fourteen other strains obtained from chancres and mucous lesions and

RECAPITULATION

	No. 10	No. 7	No. 5	No. 11	No. 19	Yaws
Number of rabbits	28	8	71	40	17	162
Generations	8	6	30	9	6	50
Time observed	1½ years	1 year	4 years	1½ years	7 months	6 years
Chancre incubation, average	42 days	36 days	39 days	34 days	30 days	32 days
Maximum and minimum	35—57 days	23—60 days	24—60 days	19—50 days	19—50 days	25—39 days
Type of chancre	Diffuse	Diffuse or slightly nodular	Indurated, nodular, tunic involved	Indurated, multinodular; tunic not involved	Soft diffuse	Indurated diffuse
Necrotic center	No	No	Yes	Yes	No	Yes
Duration of lesion, average	40 days	65 days	108 days	94 days	33 days	90 days
Maximum and minimum	30—65 days	40—75 days	60—150 days	60—120 days	7—50 days	70—120 days
External lesion	No	No	Yes, 50%	No	No	Yes, 100%
Extends to opposite testicle	No	No	Yes, 10%	Yes, 2.5%	No	Yes, 100%
Choroiditis	No	Doubtful	70%	95%	85%	No
Time required	—	—	43 days	34 days	32 days	—
Maximum and minimum	—	—	32—75 days	6—55 days	5—60 days	—
Anterior chamber	No	No	No	5%	No	No
Other manifestations	Alopecia; paronychia, 7%	Alopecia slight	Alopecia; eyelids; nasal mucosa; penile mucosa; nasal bones; paronychia	Alopecia; paronychia	Alopecia	No
Keratitis	No; from test injection	Yes	Yes	Yes	Yes	No
	Chancre strain	Chancre strain	Nervous strain	Chancre strain	Nervous strain	

studied with this end in view, such lesions were not observed.

3. Interstitial keratitis and pericorneal injection are frequent manifestations of generalization in some of various strains observed. In some, it seems to be deeper and more permanent than in others. It is more readily induced by repeated intravenous injections following the testicular lesion, if performed within two months of the testicular lesion. The organisms may be demonstrated in the corneal scrapings. This is suggestive of a definite secondary stage.

4. Ordinarily the rabbit develops only an initial lesion, following inoculation in the genitalia, eyes and eyebrows. Generalized syphilis without an initial lesion follows intravenous injections into various tissues and subcutaneous inoculations. This is suggested as having a possible bearing in the human disease. It would seem probable that the initial lesion, both in the human being and the rabbit, is an attempt at defense on the part of the individual, and that this power of reaction is possessed only in varying degree by certain tissues.

5. We are inclined to agree with Noguchi that the nervous tissue of the rabbit is resistant to syphilitic infection.

6. We were able to show that it is possible to produce nervous involvement in the rabbit without actual intracranial inoculation. We also succeeded in confirming Noguchi's sensitization experiments.

7. It was possible to demonstrate a generalized infection in rabbits from which the inoculated testicle had been removed before the initial lesion had fully developed. In one case the disease was transmitted by means of the blood serum of a rabbit, seventeen days before the initial lesion was palpable.

8. Nichols demonstrated that, in one strain at least, the removal of the inoculated testicle, as soon as the lesion was manifest, tended to favor the development of a lesion in the uninoculated testicle.

9. In our experiments, heating for five minutes at 50 C. killed the organisms. In a richly infected testicle kept at room temperature for fifty-six hours, it was possible to demonstrate slight rotary motion of the organism.

10. Two different strains were successfully inoculated into different testicles of the same rabbit on the same date. After a certain period, superinoculations are difficult to produce.

11. The interpretation of the lesions and manifestations of strains of syphilis in the rabbit so as to increase our knowledge of human syphilis requires the coincident study of the same and similar strains in the human being.

12. We have seen in the rabbit a peculiar late testicular manifestation following repeated injections, intravenous and otherwise. It shows itself as a small nodule in the testicle, and contains many very slender and elongated organisms with normal forms. When transferred, the normal type of organism appears.

13. From eight injections of human spinal fluid, only two successful inoculations were obtained.

14. We have not been able to discover any morphologic differences in the various strains studied.

15. No permanent alteration in the characteristics of the strains has been observed following prolonged growth and repeated transfers in the rabbit.

16. Granting that there are strains or types of syphilis, differing in invasiveness or predilection for certain tissues, and having in mind more especially the nervous tissues, the individual resistance of the infected person must still be considered as a possible factor in the development of the disease.

This opportunity is taken to state that a general anesthetic was employed in all operations or procedures which might be accompanied by serious pain or discomfort to the animal, and the few animals which developed a paralysis or other untoward manifestation were promptly and painlessly killed.

DISCUSSION

Owing to the fact that a number of our deductions are based on more or less theoretical grounds, one must needs be quite sanguine to hope that the fuller experience of the years to come will confirm them all to the minutest detail. In its broader aspects, it is the purpose of this paper to suggest rather than to pronounce, and it is with the hope of stimulating interest along these lines that it is presented. A larger number of strains, especially of the nervous type, should be studied over a period of time by different observers, both in the human being and in the rabbit. This should accomplish much toward the end we have had in view, and would undoubtedly give us a better knowledge of the disease which we are coming to recognize as omnipresent, alike in the palace and in the hovel, the church and the brothel, afflicting young and old, rich and poor, the innocent and the guilty, the plague of all plagues.

Army Medical School.

REPORT OF A SERIES OF SIXTY-ONE EXTRAGENITAL CHANCRES *

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The extragenital chancre is by no means an uncommon sight — to the dermatologist, at any rate — and I feel a hesitancy in reporting to this section such a short series of cases. However, the affection is rather rarely encountered by the general practitioner and, consequently, the diagnosis is deferred, as a rule, until the appearance of the secondary symptoms, a time when much damage often has been done both to the patient and to his family.

DEFINITION

By the term "extragenital chancre" I mean the primary invasion of the *Spirochaeta pallida* on other parts of the body than the genitalia — hence the frequently used term "syphilis insontium." This type of syphilis has been known since the earliest times, and authentic epidemics of innocent syphilis have been reported as early as 1577 in Austria, 1592 in Switzerland and 1596 in Germany. Most of the earlier ones were due to cupping, bloodletting, scarifying, phlebotomy, breastdrawing and lactation.

Bulkley[1] collected 9,058 instances of authentic extragenital infection; 1,810, or 20 per cent., of these were on the lips; 1,148, or 12.5 per cent., on the breasts;

* From the Department of Dermatology and Syphilis of the Western Reserve University, of the Cleveland City and of the Lakeside hospitals.
* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Bulkley, L. D.: Syphilis Insontium, New York, Barley & Fairchild, 1894.

462, or 5 per cent., were on the hands, and the remainder were distributed to almost every conceivable part of the body.

The same author, in his private practice, noted 113 cases of extragenital syphilitic infection. The largest number, fifty, were on the lips. There were fifteen each on the tonsils and fingers, seven on the breasts, six on the tongue, and the remainder were distributed to the other parts of the body. The noteworthy thing was that seventy-one of the entire list were on or in the oral and pharyngeal cavities. Most of these infections were, of course, contracted in the ordinary everyday life from dishes, towels, drinking cups, kissing, etc. However, several of them were very much out of the ordinary: for example, a young woman, after being stung by a bee, allowed her male friend to place a piece of court plaster over the sting, of course, after moistening it with his lips, and a chancre resulted.

Ricord reports a case quite similar: A portly old gentleman acted as good Samaritan to a little boy whose head was cut while at play. Mucous patches in the old man's mouth made the boy an innocent victim of syphilis.

We are now all familiar with the champion kisser of Philadelphia, as reported by Dr. Schamberg — this young man having infected nine young women by the osculatory method.

Some peculiar occurrences also have come to my attention. I should like to report a series of sixty-one cases from my private practice and from the clinic for dermatology and syphilis at the Lakeside Hospital. It will hardly be worth while to describe each case in detail so I shall merely mention the important items in connection with the most striking ones. The ages of the patients ranged from 2 months to 65 years.

Fig. 1.—Chancre of nose. Note marked glandular reaction under left jaw, differentiating it from a gumma. Ptosis is congenital.

AGES OF PATIENTS ARRANGED IN FIVE-YEAR GROUPS

Age Groups	Number
Less than 5 years	4
From 5 to 10 years	0
From 10 to 15 years	3
From 15 to 20 years	7
From 20 to 25 years	13
From 25 to 30 years	16
From 30 to 35 years	5
From 35 to 40 years	6
From 40 to 45 years	1
From 45 to 50 years	2
From 50 to 55 years	3
Sixty-five years	1
Total	61

As generally noted in such cases, nearly all of the infections occurred in the active period of life, there being thirty-three married and twenty-eight single persons in the series. The result was that only too often the life partner was then affected with either a sore on the lips or on the genitalia. Thus, little Mabel S., aged 2 years, was infected in kissing, as I judged, by her uncle. The child was brought to the clinic having a generalized maculopapular syphilid. A careful examination revealed that one of her tonsils was very much swollen, indurated to external palpation and more or less ulcerated on its surface. Investigation of the family condition was made at once, and within a few weeks her father visited the clinic with a lesion in the same place, both being right tonsils, and having a generalized syphilid. He, undoubtedly, had contracted the disease from the baby, through kissing. The mother next called with a quarter-sized, typical hunterian lesion on the genitalia. At the time of her call, the mother was five or six months pregnant, and the baby, which was born later, was likewise infected. In other words, four innocent persons were forced to suffer because of one uncured, careless syphilitic.

Primary lesions occurred on the lips in forty-three of the cases in the series; thirty-two of the lesions being on the lower and seven on the upper lip. The particular lip infected was not specified in the histories, found in old hospital records, of four cases. I found three chancres of the tonsil and one of the tongue, making the grand total of forty-seven lesions around the mouth, or 77 per cent. of the total number. This percentage is a little larger than that reported in the private cases of Bulkley, 63 per cent. In my series, also, I found ten primary lesions on the hand, four of them being on the thumb, three on the index finger, one at the base of the right little finger, one at the base of the right index finger and one at an undetermined location on the right hand. There was one primary lesion on the neck behind the right ear, one on the left jaw, one on the abdomen and one which was a double infection of the nipples.

The manner of origin of a few of these cases seems to me to be deserving of mention in detail:

Infection occurred in connection with the teeth in five instances. Bites were responsible in four cases. Two men, who had lesions on their lips, said that they had been bitten by prostitutes. One woman credited a lesion on her lower lip to the bite of her male friend. Another woman (Case 47) blamed the bites of her lover for chancres on both nipples. The fifth (Case 26) occurred when the patient was in a drunken quarrel and struck his thumb on his opponent's teeth. The resulting cut refused to heal, and the man later appeared at the clinic with an indurated sore on his thumb, oblong, and the size of a pigeon's egg. A gen-

eralized papular syphilid was presented. The opponent, we later found, had mucous patches in his mouth.

Chancre of the lip by most authors is reported to be more common on the upper lip, although this was not true in our series. A cold sore was given as the cause in three cases.

A man (Case 20) was helping dig a ditch during the cold weather in January, and the company which employed him passed large pails of coffee among the men in order to keep

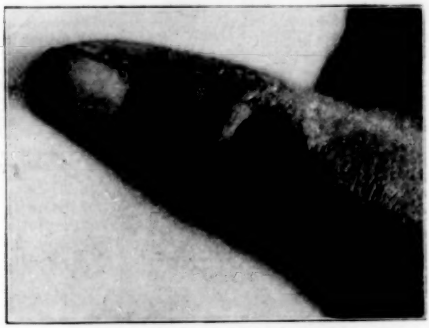

Fig. 2.—Chancre of thumb resulting from striking a man a blow on the teeth. Spirochetes present in lesion; generalized maculopapular eruption.

them warm. The result is hardly to be wondered at, considering the crowd of men who drank from the same pail. The patient had a marked papular syphilid; being a married man, his wife, of course, was also infected.

Case 5 is quite similar. A man drank whisky from a bottle, in common with several friends. His wife later visisted the clinic with a sore similarly placed on the lower lip.

In Case 16, Mrs. P., a woman aged about 65, had a similar unfortunate experience. A drinking cup kept in her house was used by some women who were cleaning. The lesion on her lip, which was seen by me after four weeks, recalled to her mind the fact that one of the women she had employed had some cold sores on her lips. Fortunately, neither her husband nor her grandson contracted the disease.

Kissing was mentioned as the causal factor in nine other cases of the disease.

Miss M., a woman aged 18, was perhaps infected in this manner by a friend. However, she was employed as a clerk in a telegraph office, which fact suggests the possibility of her being infected by moistening her finger in turning over from 700 to 800 telegrams every day.

Of the remaining thirty-three chancres of the lip, in Case 51 a woman contracted it from her husband immediately after marriage. In Case 45 a man felt that he had been infected by a fellow laborer on a farm. In Case 53 the patient had a crack on the lower lip. In Case 57 the patient attributed it to a scratch on the lip.

In Case 60, in which there was a chancre of the tongue, a man could give no cause for the lesion, but confessed, as had the other patients with lip primaries, that he ate nearly all of his meals in restaurants.

In two of the tonsil cases, the circumstances have already been given. In the third case, the cause was unknown.

The barber shop was the only cause ascertainable in the case of a chancre on the neck. The patient said that he had received a cut on the neck; that from this cut was formed a sore which refused to heal. Local cauterization and different treatments, before coming to the clinic, had been without avail, the correct diagnosis having evidently not been made. The patient, on entrance, presented a generalized syphilid together with a raised lesion, dollar-size, showing a diffuse, brawny induration and the floor of the ulcer covered with pus. Figure 3 shows the appearance of the man's neck clearly. Though a married man, his wife, fortunately, did not contract the disease. He afterward informed us that two other men, to his knowledge, had contracted similar sores in this barber shop. However, I never succeeded in getting track of them. The barber also removed his shop.

In Case 61, a man, aged 26, had a chancre on the lower jaw, for which he also blamed the barber shop that he patronized. He received a cut on the jaw, while being shaved. This cut, instead of healing, kept getting larger until he consulted a physician and, finally, a diagnosis of chancre of the jaw was arrived at—after the appearance of secondaries.

I have already spoken sufficiently of the chancres of the nipples. Before the days of the Wassermann test, this was very common in connection with wet-nursing, but it should now be a thing of the past in any well regulated clinic.

My one case of chancre of the abdomen is very interesting:

The babe was born in the Cleveland City Hospital about the middle of November, 1915, at which time the mother showed no evidence of syphilis and had a negative Wassermann. About Jan. 1, 1916, the mother brought the babe to our clinic because of an ulcer on the abdomen and of sores in the groins. Examination showed a large, almond-shaped, much indurated lesion in the right lower quadrant, with suppurating inguinal glands. No definite diagnosis was made at that time, but a weak mercury ointment was prescribed. The mother returned with the baby a week later, at which time she herself had generalized secondaries, and on this we diagnosed the child's condition as a primary infection of the abdomen. We made an examination for spirochetes but found none because of the mercury ointment used locally. The diagnosis was confirmed, however, by a generalized eruption which appeared several days later. The mother probably had been infected some little time before the child was born, and the babe, in passing through the vaginal tract, received an infection from the mother's primary lesion. The condition is rather unusual, as such cases generally have the seat of invasion on the cord.

Fig. 3.—Chancre back of right ear resulting from cut by barber. Spirochetes present in lesion; generalized maculosyphilid.

Ten cases of chancre of the hand were found in this series, and I feel that several of them deserve especial mention because of their unusual symptoms and circumstances.

Case 52 was a lesion of the thumb in a little girl aged 13 years. Outside of the fact that she had once used a common, hotel towel, no reason for the lesion could be advanced.

In Case 1 a man who had a characteristic chancre of the thumb, much like the one illustrated, blamed a pin prick for

his trouble. Just what significance a pin had, we could not determine, but he was a married man and no other cause could be ascertained.

In Case 27 the patient, who was a ship carpenter residing in a house of ill repute, had a chancre at the base of the dorsal side of the right little finger. A cut at this spot on his hand refused to heal. Later, secondary symptoms appeared on his body. As the cause of his trouble he blamed the towels and wash bowls in the house.

Fig. 4.—Chancre of nipples and generalized eruption, result of bites.

Case 53 was a primary lesion on the index finger of a negro porter who was accustomed to cleaning the urinals with bare hands. The result, in a public urinal where cotton, etc., is wont to accumulate, is not to be wondered at.

The remaining five of our cases of chancres on the hands were all in physicians. The first was Case 14, in which a chancre on the left thumb puzzled both Dr. John Phillips and me because no especial primary lesion could be found. The physician could only remember that he had a small crack on the thumb, at the junction of the skin with the external nail-fold. This neither increased in size nor did it pain him. It persisted, however, although he did not especially note it. About four weeks later, he began to be troubled with vague rheumatic pains, which were treated with acetylsalicylic acid (aspirin). A faint eruption began to appear after one week, but it was treated as an aspirin rash, since the doctor had no evidence of a primary lesion or of any lesions of the mouth. The eruption failed to clear, after the drug was stopped, however, and we finally made the diagnosis of secondary syphilis. The physician was married and had several children.

Case 23 was a typical, indurated, chestnut-sized lesion on the right index finger, together with an enlargement of the

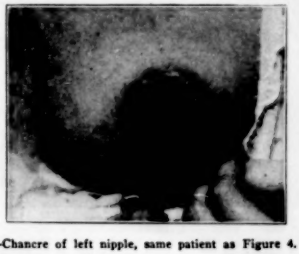

Fig. 5.—Chancre of left nipple, same patient as Figure 4.

cubital and axillary glands. Just when the infection took place, the doctor was not sure, but he had several gynecologic cases under his care some time before and felt that he must have been infected then. The true condition, luckily, was made out before the appearance of other lesions.

Case 48 was an infection in an open wound at the base of the right index finger. The doctor was called to a bleeding parturient, and in the emergency was forced to remove the placenta manually, without gloves. The wound refused to heal, notwithstanding the fact that after the emergency services exceptional care was taken in washing. Treatment was not instituted until the appearance of the secondary symptoms.

Case 49 was a lesion of the right index finger in a medical missionary. The doctor had operated without gloves. Later, a lesion appeared whose character was not suspected until the appearance of a macular eruption.

Case 54 was rather an irregular one, as we could find no primary infection, but felt that the seat of invasion must have been on the right hand because of the marked enlargement of the cubital gland. About Dec. 1, 1915, the doctor had been called in consultation for the purpose of removing the tonsils from a hospital patient. He found the patient in the operating room and, under a general anesthetic, cut out the tonsils, which showed nothing save redness and enlargement. Immediately after the operation, the sheet having been thrown back by the struggling patient, the doctor noted, and recognized as syphilis, an eruption on the patient. As he had not worn gloves, he scrubbed his hands with extra care, and then dismissed the case from his mind. Later I noted a generalized eruption, and by questioning the doctor, established the diagnosis of secondary syphilis.

Such is the history that only too often one gets with the syphilis of extragenital origin. Because of the location of the sore, or because it is atypical, no diagnosis is made until the appearance of the secondary symptoms.

Fig. 6.—Chancre of thumb in girl aged 13; cause unknown.

Late diagnoses occurred thirty-seven times in the series of sixty-one cases. The percentage, in comparison with that of others, is low, if anything.

Bulkley found that in all of his cases of chancres of the hand the patients had secondary symptoms before they consulted him. A physician gave him a history similar to one already given in this article. The doctor had a small sore on the side of his middle finger. It healed readily, but its true nature cropped out later, when the eruption appeared.

Jullien,[2] also, mentions a case in which there was merely a puncture of the pulp of the finger. This healed by first intention. The appearance of the secondary eruption was the first intimation of further trouble.

Considering these facts, it appears that the diagnosis of extragenital chancre is not always easy; that many times the unsuspecting patient will let it run along until other symptoms make him think that he has something serious. These considerations apply to chancres of the body in general, but to extragenital lesions in particular. One must always be on guard, therefore — witness my two cases and the ones reported by Bulkley and Jullien.

Lambkin found digital chancres generally very painful. This was true in several of my cases. Given any

2. Jullien: Ann. d. dermat. et de syph., 1899, x; quoted by Shillitoe: System of Syphilis, d'Arcy, Powers & Murphy, i, 258.

single sore on the body which tends to persist, to increase in size and induration, and to involve nearby lymph glands, one should always keep the chancre in mind. The typical lesion will be hard, will increase rapidly in size, and will show little or no ulceration and suppuration, but, on the contrary, it will show a building up of tissue. The draining glands, especially

Fig. 7.—Gumma of tongue; history of chancre on lip two years before.

those about the head, will be involved very early, and will show a peculiar boardlike hardness that is almost pathognomonic.

Ricord called attention to this long ago. He says that it depends on the rich lymphatic supply of the face. However, as can be readily shown from my series of chancres in medical men, the extragenital chancre is only too often a fleeting, atypical affair making the diagnosis very difficult.

In a differential diagnosis, one must keep especially in mind the gumma and the carcinoma. This applies in particular to the lip. During the past several years, I have treated three cases of gumma of the lips, two of them being gummas of the upper lip and one of the lower lip. The lesion in each case answered all of the physical requirements of primary lesion, except that the duration was a little long and there was no especial glandular involvement. One of them, I might add, was referred by another physician as a case of carcinoma.

Neither the gumma nor the carcinoma, however, has the acute inflammatory character of the chancre. Yet many a primary lesion and many a gumma, especially on the lip, have been excised as being malignant. I have seen two cases of this sort in the past six months.

In any case of doubt, an examination with the dark field illuminator, in an early sore, or together with a Wassermann reaction in an older one, will clear the diagnosis at once. A carefully taken history is also of great value.

I believe it to be the best rule that in any persistent sore, no matter how trivial and no matter what its location may be, the extragenital chancre should be ruled out in making a diagnosis. The prognosis of extragenital chancre, like that of all syphilis, provided proper and sufficient treatment is carried out, is good.

It has been noted by some writers that with primary lesions about the head, the infection is liable to be especially grave, often with an early involvement of the cerebrospinal system. I have not found this to be true in the patients coming regularly for treatment. The principal task has been to make them come regularly. Despite the warnings and the printed directions, four of the patients have been seen only once, three of them having had primary lesions on the lip and one a chancre on the thumb. Two patients absolutely refused to take any treatment, and I have lost sight of them. This was some time ago. If they had been lost sight of in the past two years, I should have notified the department of health and had them transferred to the detention ward at the City Hospital.

One patient came only three times; six, only two times; two, four times; one, seven times; one, nine times; two, ten times; two, eleven times; one, thirty-four times; two, thirty times; one, thirty-five times, and one, thirty-six times.

Twenty-nine of the total number are still taking treatment, very regularly, in most cases. Twelve of my private cases are helping to swell this total.

Attendance cards are now being used. We send postals and employ the social service department in visiting the patients. We note that there is considerable improvement in the matter of attendance.

About 50 per cent. of these patients are now taking regular treatment for their ailment. This is a very important matter, since too many of them are an especial menace to society.

In the series of sixty-one extragenital chancres, one babe infected her father and he, in turn, infected the mother and her unborn child. Two men, who had lesions on their lips, infected their wives. A babe aged

Fig. 8.—Chancre of lip, contracted from husband.

19 months transplanted its lip lesion to the lip of the mother, who, in turn, transmitted the disease to her husband.

These are the only authentic secondary infections in the series, but, no doubt, many others took place.

The prophylaxis of syphilis, in other words, is one of the most important problems before the medical profession today.

Many of the cases were due to the use of the drinking cup. Yet we may still see it in many of our large stores and manufactories and even in some of our hospitals. How many of us have been served with unclean silverware and dishes in restaurants and at soda fountains?

There should be stringent laws, enforced by careful inspection, requiring the placing of all dishes, glassware and silverware in boiling water for the space of five minutes, even if the microscopic dust be not removed. This would effectually kill all organisms and fully protect us.

Two of our patients contracted syphilis in the barber shop. Too frequently we find barbers using towels over and over again. They are often used twice in some of the most pretentious shops. Would it not be well to require frequent sterilization of razors and brushes with alcohol? No barber shop thinks itself complete without the alum and silver nitrate stick, despite laws prohibiting their use.

Closer supervision of the public towels and soap also would serve to lessen the extragenital infections with syphilis. Moreover, any patients in a dangerous condition, whether they be in families or in the public service, and especially the latter, should be removed to a hospital for a sufficient length of time, in order to remove the most glaring cutaneous lesions, whether of the mouth or of the integument.

Such is the routine now being carried out by us in connection with the venereal ward at the Cleveland City Hospital. Generally, two or three weeks entirely suffice, the patient in that time receiving three injections of salvarsan and as much mercury as he will tolerate. After this course of treatment, patients return to the Lakeside Hospital clinic for follow-up treatment. In our series of ten chancres on the hands, five of them, as already noted, were in physicians. In Bulkley's series of fifteen chancres of the hand, ten were in medical men.

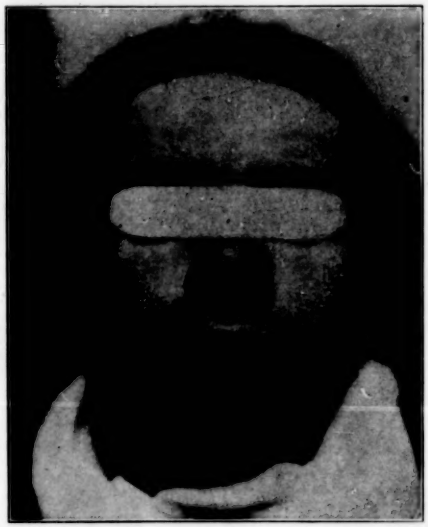

Fig. 9.—Chancre of lip, contracted from farm hand through drinking utensils. Note edema.

Montgomery[3] reported seven cases, six of them being on the hands. Nine out of twenty cases reported by Brandis[4] and Morrow,[5] each reporting ten cases, are quoted by Dr. Montgomery as having been contracted while on gynecologic or obstetric cases.

Fournier[6] reports a series of forty-nine extragenital chancres, thirty of them having been in physicians.

3. Montgomery, D. W.: The Acquisition of Syphilis Professionally by Medical Men, Jour. Cutan. Dis., 1905, xxiii, 145.
4. Brandis: Deutsch. med. Wchnschr., 1898, xxiv, 329.
5. Morrow, P. A.: Jour. Cutan. Dis., 1896, xiv, 125.
6. Fournier, A.: Les chancres extra-génitaux, pp. 447-450, reported by Montgomery (Footnote 3).

Often the question is raised about the acquisition of syphilis from the cadaver. Two such cases have been reported by Taylor.[7] One case was acquired from a body eight hours postmortem, the other from a body dead nine hours. Morrow, also, has published an account of one such case.

Only too often is the physician an innocent victim of the extragentital chancre, and he cannot use too much care in the examination of his patients. All patients should be suspected of syphilis. In that way, only, safety lies.

No physician should make a vaginal, an oral or a rectal examination without gloves. The doctor who operates without them places himself in the greatest danger. In my experience, nose and throat men are especially prone to take chances. Plenty of chances, too, are taken by dentists, nurses and midwives in their work.

I wish to emphasize the importance of an early diagnosis, and to recommend the use of the heaviest possible treatment for a long period of time.

The profession, as well as the public, must be educated as to the gravity of the disease, and our syphilitics should have proper instruction in regard to their daily walk of life and as to the importance of treatment. Moreover, our medical schools should give more time, in their curriculums, to the diagnosis and handling of early syphilis, since at this time the best results can be obtained.

Stringent supervision of our barber shops, of our restaurants, hotels and soda fountains, of our drinking cups, etc., I believe, would also assist in preventing so many innocent victims of syphilis.

7. Taylor, R. W.: Jour. Cutan. Dis., 1890, viii, 201.

New Physiology.—Medicine needs a new physiology which will teach what health really means, and how it is maintained under the ordinarily varying conditions of environment. We also need a pathology which will teach how health tends to reassert itself under totally abnormal conditions, and a pharmacology which will teach us, not merely the "actions" of drugs, but how drugs can be used rationally to aid the body in the maintenance and reestablishment of health. The new physiology, new pathology, and new pharmacology are growing up around us just now. I can see them more particularly in the splendid advances which the medical and other biologic sciences are making in American. You have the advantage of having less of old intellectual machinery to scrap than we have in the old countries; but perhaps we shall not be much behindhand.—J. S. Haldane: The New Physiology, *Science*, Nov. 3, 1916.

EXTERNAL FRONTAL SINUS OPERATION *

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CHICAGO

The closing words by Dr. O. T. Freer[1] in his recent article on the intranasal operation on the frontal sinus for the cure of chronic suppuration were as follows:

"In cases where with the sinus open for drainage, marked suppuration continues after the intranasal operation, the external operation must be resorted to. Where great swelling of the lids, exophthalmos or cerebral symptoms indicate the existence of caries of the sinus wall and progress of the disease beyond it, in the form of Killians' sinusitis frontalis, the intranasal operation should not be done.

Fig. 1.—*A*, small size; *B*, large size; *C*, smooth surface.

That is my belief with the exception that I should like to modify and amplify his remarks. When he says the external operation must be, I say should be done, because I have a very vivid recollection where I insisted that the external operation be performed and subsequently wished I had not been so insistent, although a cure was established. I am referring to the external deformity. Aside from the conditions mentioned above that would indicate an external operation I wish to call attention to the pathology of the frontal sinus which can be learned from good Roentgen-ray plates. This I have controlled by the histologic examination as well as the postoperative reading of the roentgenogram.

If one takes a stereoscopic roentgenogram and studies it both stereoscopically and pseudoscopically one will be able to interpret certain definite anatomicopathologic conditions of the sinuses. For example, it is possible to differentiate an acute from a chronic inflammation; a suppurative from a nonsuppurative affection; a cavity filled with polypi from one that is not. Likewise it is possible to diagnosticate the presence of a sequestrum or a foreign body. It is all in the judgment of shadows or degree of densities, with particular emphasis on certain definite outlines. It is impossible to cover this phase of the subject in a paper such as this, but suffice it to say that the value of the roentgenogram is very much underestimated from the pathologic point of view and I would recommend that the team work between rhinologist and roentgenologist be encouraged. So far as the anatomic side of the question of the roentgenograms is concerned, I believe we are all agreed that it is indispensable in operative work.

Pathologic Changes.—Macroscopically as well as microscopically we have the following forms of changes in the frontal sinus.

1. Simple congestion or acute inflammation of the mucous membrane lining.

2. Simple congestion or acute inflammation of the mucous membrane lining, plus acute osteitis, even necrosis.

3. Chronic infiltration of the lining membrane with myxomatous degeneration. Epithelium very much thickened with excessive secretion.

4. Chronic infiltration of the lining membrane with myxomatous degeneration. Epithelium very much thickened with excessive secretion plus superficial osteitis.

5. Chronic infiltration of the lining membrane with myxomatous degeneration. Epithelium very much thickened with excessive secretion, superficial osteitis and necrosis even to a degree of sequestration, and we may have in some places ulceration of the epithelium and true granulation formation.

6. Hyperplasia of the lining membrane with very little round cell infiltration, but myxomatous changes to a degree of polyposis. The bone is not changed at all or at most there is a rarefying osteitis.

7. Characteristics of tuberculosis, syphilis, malignant disease and foreign bodies, in addition to the chronic infiltrative inflammation. Bone changes are very common, especially in the syphilitic form.[2]

These various pathologic changes will each require certain definite methods of treatment, either surgical or nonsurgical, to bring the case to a successful issue. *The anatomy* with particular reference to the distance between the anterior and posterior surfaces of the sinus and the extent toward the temple will influence one as to the technic to be pursued. Also the outlet of the frontal sinus as to how much room is obtainable by an intranasal method of operation is important. I wish to call attention emphatically to the epithelial lining of the outlet of the frontal sinus. It does not matter how large the outlet is made, whether by an intranasal or an external operation, if the mucous membrane is entirely destroyed and the bone in any way disturbed, particularly the internal nasal crest, there will follow constriction that is liable to defeat the best operative procedure.

Fig. 2.—Mrs. L. and Mrs. D.

It must be remembered that the various bones in the region of the outlet of the frontal sinus respond differently when curetted or subjected to the burr. Whenever the region of the nasal bones at the junc-

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

† Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

‡ This paper and those by Drs. Hurd and Cott which follow are parts of a symposium on "Chronic Suppuration of the Nasal Accessory Sinuses." The remaining papers by Drs. Shambaugh, Sauer, Loeb, Skillern and Iglauer and the discussion will appear in THE JOURNAL for December 23 and 30.

1. Freer, O. T.: Laryngoscope, December, 1915.

2. Demonstrated by lantern and more extensively described in Transactions and reprints.

tion of the internal nasal crest is attacked, there is a great deal more of reactionary osteitis than when the bone of the ethmoidal region is broken down. This is due to the lack of cancellous structures in the latter. In view of this fact it has been my practice to carefully avoid this region (internal nasal crest) of the frontal sinus, and rather enlarge toward the ethmoidal region, that is posteriorly and laterally, as suggested by Mosher.

Fig. 3.—Acute inflammation with acute osteitis; marked thickening of epithelium.

In reviewing the final results from the various external operations on the frontal sinus, I would like to confine myself to my personal results or those that came under my observation rather than to repeat the opinions of others, trusting to the discussion to bring out any deficiency in my report.

1. *Kunt-Coakley Operation.*—In acute cases the simple external opening and draining for a short period of time in the frontal sinus region with subsequent middle turbinectomy and ethmoid curettage have given universally good results, and only in cases in which the acute condition was one of acute exacerbation of a chronic form was there subsequently a more formidable external operation necessary.

Fig. 4.—Pyogenic lining membrane with thin layer of epithelium.

2. *Killian Operation.*—Probably no surgical procedure of the nasal accessory sinuses provoked a greater attention and discussion than this radical procedure for the cure of chronic suppuration of the frontal sinus. It must be further admitted that strictly surgically speaking, the same procedure is necessary today if one desires to speak about an absolute cure. At the same time I do not believe I am very far from the truth in stating that the radical Killian operation for the cure of chronic suppuration of the sinuses (fronto-ethmo-spheno-antrum) is seldom performed at present. In fact, the reaction came as soon as the intranasal procedures were successfully practiced and when the laity revolted against the marked deformities that resulted in the cure. My own personal experience with the Killian operation dates from 1903, when I operated on a chronic suppurative pansinusitis in a man whom I presented before the Chicago Oto-Laryngological Society, as a cured case. It was one of the first cases presented in this country so far as I have been able to find from the literature. After that I performed a fairly good number with absolutely satisfactory results, except for the deformities. This latter fact led me to develop a technic which was not to take the place of a radical cure but rather a conservative measure, which I presented before this section in 1909, namely, an osteoplastic flap operation on the frontal sinus. There is one particular case of Killian operation that I would like to mention because, as I said in the beginning of my paper, it is very vividly in my mind, and because the narrative of this experience may help some one else in avoiding the performance of a bilateral Killian operation in a very large and deep frontal sinus, even in a man. This patient, a mechanic, came to me with an acute fulminating frontal sinusitis on both sides. After several weeks of drainage and intranasal surgery it became necessary to do the external operation. The patient never showed any disposition to oppose the external procedure. The Roentgen-ray picture showed a markedly pathologic, large frontal sinus on both sides. At operation I found a so-called double frontal sinus in the anteroposterior direction, but am sure it was a large bulla ethmoidalis reaching high in the region of the frontal sinus as first suggested by Logan Turner. This condition was present on both sides. After healing occurred there resulted a marked depression,

Fig. 5.—Pyogenic lining membrane without epithelium.

although I was very careful to preserve a good supra-orbital ridge. One day while the patient called I demonstrated him as a fine result to Dr. B— of California, who was visiting me at the time. The patient expressed himself most disgusted, in fact, in a threatening manner, stating that he would get even because I made him conspicuous and a subject of ridicule in the shop where he worked. I was so impressed with this threat that I had the man watched for some time.

3. *Modified Killian Operation.*—Just before the intranasal operation became well developed or in cases in which it did not suffice, various procedures were advocated with variable results. One of the first modifications, owing to the marked diplopia resulting, was the leaving of the roof of the orbit intact, thus preserving the pulley of the superior oblique. In another instance, the nasal process of the superior maxilla was not attacked because it often left a deformity on the side of the nose and necessitated the prolongation of the external incision. Finally, less of the anterior wall of the sinus was being removed, and by making a large opening into the nose by taking away as much as possible of the floor of the sinus,

Fig. 6.—Chronic fibrous and glandular hyperplasia of lining membrane.

one was satisfied even though obliteration was not obtained. The criticism of these procedures is that the lining membrane has often times been sacrificed unnecessarily because the cavity could not become obliterated and because lined by a granulation, which is not as good a nutrition to the bone as the membrane itself, even though the latter be not normal. Besides, this granulation membrane secretes a great deal more. Though less of the anterior wall is removed, depression will nevertheless result.

4. *Lothrop's Operation.*—At the meeting last year of this section Dr. Howard A. Lothrop[3] presented a procedure that, according to his report, meets all the requirements of curing a chronic suppurative sinusitis, especially if intranasal procedures failed and if there be an external fistula present. The procedure consists in making an opening about the size of a half dime above the inner canthus or below the eyebrow in what is known as Ewing's space, through which he enters the frontal sinus. By way of the nose and through this created opening in the frontal sinus, the internal nasal crest is removed, leaving sufficient bone in order not to get a collapse of the bridge of the nose. Then the floor of the frontal sinus is removed. Now comes an entirely new procedure, namely, the removal of the perpendicular plate of the ethmoid constituting the upper most anterior portion of the nasal septum.

Fig. 7.—Chronic suppurative infiltration of membrane with cystic myxomatous degeneration.

This removal is continued into the frontal sinus, where the septum of the same is also removed. Through the same original opening and the opposite nostril the floor of the other frontal sinus is taken away, as well as any projecting remains of the internal nasal crest. The external wound is then closed up. The result is that both frontal sinuses empty into one large opening, which may discharge in either nostril; in other words, one may enter either frontal sinus from either nostril, or both sides from one nostril. My criticism is, or I should say was, that as a result of drilling the internal crest as well as the posterior surface of the frontal

Fig. 8.—Cystic myxomatous degeneration of lining membrane.

sinus outlet, the resultant opening would narrow, although not as much as if each sinus was operated separately, and furthermore the same criticism that I have to my own procedure, which I am about to describe, that is, if only one sinus is involved one would necessarily infect the other sinus or else this

3. Lothrop, H. A.: Frontal Sinus Suppuration with Results of New Operative Procedure, THE JOURNAL A. M. A., June 10, 1915, p. 153.

procedure could not be carried out. I say that it was my objection rather than is, because since the presentation of this subject by Dr. Lothrop, I have seen a modification tried by Dr. Richards of Fall River, Mass., and Dr. Lynch of New Orleans, which makes me feel that this procedure will find a place, especially for the fistula cases. With the permission and apologies to Drs. Richards and Lynch, I will state what I saw them do and then describe my suggestion of this procedure as a result of personal experience.

Fig. 9.—Myxomatous or polypoid degeneration of lining membrane.

Their case was one of chronic frontal sinusitis with fistula from a previous operation. Their modification was the employment of hand drills (Fig. 1) which had only cutting edges on the anterior half of the burr, the posterior being smooth, thus avoiding the destruction of the lining membrane of the outlet posteriorly, and prevented subsequent cicatrization. In a patient I recently operated on I had a fistula with depression following operation, in which I performed the Lathrop operation, but avoided the internal nasal crest by protecting it with a Halle protector and using an electric oval drill. The result is very satisfactory now, eight weeks since operation.

5. *Beck's Osteoplastic Flap Operation.*—Permit me now to briefly describe the procedure which I recommended eight years ago as an external nonobliterating operation in those cases that appear to be unsatisfactory after an intranasal procedure. I might say that I have had to change but one thing in the technic since I first presented it before this section, and that is the avoidance of the destruction of the lining membrane of the internal nasal crest.[4]

STEPS OF OPERATION

1. Roentgenogram, postero-anterior, for proper anatomic outlines.

2. Celluloid model made from tracing of frontal sinus, from roentgenogram.

3. Incision through skin and subcutaneous tissue along the upper margins of the eyebrows, and these united across the bridge of nose.

4. Dissection of the skin and subcutaneous tissue flap upward.

5. Celluloid model placed over exposed area.

6. Incision through periosteum along the margin of the celluloid model.

7. Chisel and burr along this lateral periosteal incision from one supra-orbital margin to the other in the interior of the frontal sinus.

8. Gigli saw engaged in the upper edge of this incision and brought down to the level of the supra-orbital margin, thus cutting the septum of the frontal sinus, then saw slightly upward to weaken the pedicle.

9. Turn this osteoperiosteal flap down. Remove the pathologic tissue, but carefully avoid exposure of bone of any great extent.

10. Enlarge outlet of sinus in the nose backward and outward by means of electrically driven burr, carefully avoiding the internal nasal crest by use of Halle protector.

11. Semisolid rubber tube inserted into the outlet, one end coming at or near the nostril, the upper end at the beginning of the outlet. Through this tube a strip of prepared gauze is packed, the upper end loosely filling in the cavity of the sinus.

12. Osteoperiosteal flap brought back into position and the skin and subcutaneous tissue flaps brought down and sutured or closed by use of clips.

After-Treatment.—On the second day remove the gauze, on the fifth day the tube. No further drainage is necessary. Subsequently but not before three weeks, wash the sinus with normal salt solution, or injection of bismuth paste into the sinus may be done.

In the criticism of the procedure I would say that if only one side is affected one may take off just the one half of the anterior surface of the sinus, that is, employ the fine burr or chisel to follow a celluloid model of just the size of the sinus to be exposed. The skin and subcutaneous flap, however, should be the same as if both sinuses were to be exposed. This is an objection in that one may infect an otherwise healthy sinus. I have no doubt that I have done this very

Fig. 10.—Solitary fibrous polypi in frontal sinus.

thing several times, without any untoward results, because the procedure healed the infected sinus, and thus prevented reinfecting the healthy sinus to any extent. As to exact statistics I will state that I have since 1908 performed this operation thirty-one times with an apparent cure in twenty-seven cases. In two of these four cases I operated away from home, and never heard whether they were satisfactory or not; the other two had to be reoperated, converted into the

4. The various steps of this operation were demonstrated by lantern slides, and will be more extensively described in Transactions and reprints.

Killian. These were the early cases in which I used to make a large opening into the nose, taking away some of the internal nasal crest and in which the mucous membrane of the entire circumference of the outlet of the frontal sinus was destroyed. These reoperations would have been good cases for the Lothrop operation.

In conclusion, I would like to present the histories of the end-results in the two patients whose photographs are shown in Figure 2. It must be stated that the frontal sinus in the malformed case was evidently much larger and extended far over the orbit.

CASE REPORTS

CASE 1.—Mrs. L. started in May, 1912, with a very severe pain in the left eye which was diagnosed by two ophthalmologists as glaucoma. She then consulted a rhinologist who diagnosed, from his nasal examination, a closed off acute frontal sinus disease on the left side. He performed an anterior turbinectomy, following which there was a free escape of pus and marked relief of her symptoms. This relief lasted only about two weeks when the symptoms returned, only much more stormy, accompanied with chills and a cracking sensation about her eyes. There appeared to be no improvement from the pains and discharge, so she was referred to a Chicago rhinologist to determine whether external frontal sinus operation was necessary. The latter advised an ethmoid exenteration and reopening of frontal sinus within the nose. This the attending rhinologist performed. This procedure was followed by comparative comfort for about four months, when symptoms began to return, especially a feeling of a plug formation in the front part of the head. The attending rhinologist performed a Good intranasal rasp operation on the frontal sinus. For six months following this procedure the patient was fairly free from symptoms, when they returned more severe than ever and the attending rhinologist brought the patient to me. I found the left nasofrontal passage outlet completely blocked and the roentgenogram definite of a marked diseased condition. The headaches were so persistent and severe, and there being some rise of temperature, we decided on an external operation and my osteoplastic procedure was performed. We found the entire frontal sinus was filled with a thick pyogenic membrane which proved to be so by subsequent microscopic examination. The ethmoidal region was again recuretted, as well as the antrum and sphenoid explored, and their natural openings enlarged. A very large opening between the frontal sinus and the nose was made by means of electric burrs. The immediate as well as the subsequent course of this case was uneventful and the patient is now perfectly well, after more than one year. I am so informed by her attending rhinologist today. The photograph (Fig. 2) was taken three weeks after operation, and shows the absence of any deformity.

CASE 2.—*History.*—Mrs. D., aged 45, suffering with chronic suppuration of the sinuses for a number of years, consulted a well known otolaryngologist of New Orleans, who had her under treatment for some time, performing the customary operations and reoperations within the nasal cavity. As the patient was still having suppuration in the nose as well as pain and headache, the physician was compelled to resort to an external operation. A bilateral frontal sinus operation according to Killian was performed. The patient did not get along very well on account of retention, which made him operate a second time for the purpose of allowing the cavity to remain open and granulate from the bottom. This, however, did not take place, as whenever the external wound closed, retention would result with subsequent fistula formation.

The patient was obliged to remove to New York, and on the way consulted an otolaryngologist in Chicago who reoperated on the frontal sinus and performed a bilateral Denker operation. After apparent healing had taken place, the patient went to New York, and soon after experienced retention above the left eye with considerable pain. She consulted another otolaryngologist in New York who concluded that the patient should wear a silver cannula leading from the retention pocket into the nose, similar to the stylet worn in chronic dacryocystitis.

April 7, 1914, about four years after the last attention, she consulted me. I found a discharging fistula above the inner canthus of each eye, and in the bottom of the left fistula the small silver cannula just mentioned. A complete analysis of the case was made and an operation decided on.

The patient, however, developed an acute otitis media suppurativa requiring a paracentesis. She again returned to New York, where this condition was treated.

In October, 1914, she returned to me for operative work and I learned that in the meantime the right fistula, while closed at the time she had left me, had spontaneously opened two or three times during her present stay in New York.

Before resorting to the operation, an autogenous vaccine, an anaerobic micro-organism being particularly cultivated, was made, and injected for about three weeks. The fistula was injected with bismuth paste No. 1 in order to disinfect it. Ten mg. of pure radium element was placed within the nasal cavity in the attic region, and Roentgen rays, by the deep penetration method by water cooled tubes were applied from the outside as a crossfire. This combined vaccine, radium, Roentgen-ray and bismuth paste treatment, as well as internal administration of large doses of hexamethylenamin was given preliminary to the operation because we expected to expose such important structures as the dura and orbit, and thus lessen infection of them.

Operation.—We found, following the left fistula outward and backward, a cavity of considerable size, reaching over the orbit to the region in close proximity to the optic foramen. It seemed to pass downward and backward to its outer surface. This cavity was lined with pyogenic material which, when removed and subsequently examined microscopically, was shown to be covered with a thin layer of epithelial cells. This pyogenic material was therefore scraped, and the bone over the orbit as well as the under surface of the frontal bone or roof of the frontal sinus of that diverticulum was removed by an electrically driven burr to its very limits. This procedure caused the exposure of the dura above and the periosteum of the orbit below. The previous operation allowed a considerable overhanging of the supra-orbital margin, and this too was removed to a marked extent, in order to have complete control of the newly made cavity. This cavity was packed with gauze for about one week until healthy granulations were lining it, when bismuth paste No. 2 was injected and the cavity allowed to heal.

Three weeks after the operation the patient was desirous of going home and I referred her to a well known specialist in Philadelphia, the condition then appearing as in Figure 2. He made the following statement in a letter to me: "Find that the wound is healing up nicely and suppuration has entirely ceased. It looks to me as though you were going to have an excellent result. I told her to return again if there was any further trouble, but believe from its appearance that everything will be well with her."

About two months later I received a report saying that she felt absolutely well and the sinus remained closed. It is my intention to do plastic work which will fill up the cavities which have deformed this patient, although she is cured of her suppuration.

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Surgical Judgment.—Surgical judgment means more than the knowledge necessary to make a rough diagnosis, or the technical skill to perform stereotyped operations. It implies a certain clinical experience, which enables one to weigh up the advantages or disadvantages of an operation to a particular patient, the knowledge of the risks and complications besetting such an operation, nay, more, the ability to foretell the benefits that may accrue, and the evils (if any) that may follow after.—John H. Watson, *Practitioner*, October, 1916.

INTRANASAL SURGERY FOR RELIEF OF CHRONIC FRONTAL SINUSITIS *

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The frontal sinus is formed from the expansion of an anterior ethmoidal cell into the frontal bone or as a direct extension of the infundibulum.

Usually there are two sinuses, but it is important to remember that one or both may be absent, and that there may be as many as four or five distinct sinuses, communicating with the nasal cavity by their own ostia.

One sinus may be underdeveloped, and the sinus of the opposite side may have expanded beyond the median line and formed part of the superior and anterior wall of the smaller one, and also an anterior ethmoidal cell may have a large orbital extension and its anterior wall bulge into the posterior part of the frontal sinus, forming the so-called bulla frontalis; and this ethmoidal cell may be the seat of disease which will simulate frontal sinus disease, while the frontal sinus is normal.

The frontal sinus may barely reach the brow, or it may extend upward fully 2 inches and externally, nearly 3 inches, and may also have a recess over the orbit, extending backward almost to its apex.

In considering intranasal treatment of the frontal sinus, the relations of the anterior ethmoidal cells and the infundibulum are as important, if not more important, than the frontal sinus itself, because inflammation of the frontal sinus rarely exists without a similar condition in the anterior ethmoidal cells; and these, together with the structure about the ostium of the frontal sinus, are the practical anatomic points in the intranasal surgery of the frontal sinus.

The infundibulum, with its superior wall, formed by the bulla ethmoidalis, and the inferior wall, the process uncinatus, should be considered the guide to the anterior ethmoidal cells and the frontal ostium.

The bulla ethmoidalis contains one or more cells which extend to the orbit, and has sometimes extensions over the orbit.

The anterior expansion of the meatus medius and the infundibulum is the recessus frontalis of Killian, or better divided, according to Davis,[1] who suggested that the anterior portion of the infundibulum lateral to the processus uncinatus be termed the recessus infundibularis, into which the infundibular cells drain; and that portion of the recessus frontalis lying medial to the processus uncinatus, which forms a concavity beneath the extreme anteriosuperior attachment of the concha media, be termed the recessus conchalis, into which the frontal cells drain.

This divides the anterior cells into three groups, namely bulla cells, infundibular cells, and frontal cells.

The concha media, which is a prolongation downward of the inner ethmoidal wall, especially in front, acts as a curtain, concealing the structures laterally.

If the anterior attachment of the concha media is high, the frontal cells are apt to be well developed, and if attached low, the infundibular cells are more apt to be well developed, while the frontal cells are deficient. This may be of value in determining the position of the frontal ostium.

The frontal sinus communicates with the nose, according to the origin of this sinus, namely, in 60.4 per cent. it communicates with the meatus medius, and in 39.6 per cent. with the infundibulum (Davis).

In the latter class the discharge from the frontal sinus may drain directly into the antrum, the infundibulum acting as a gutter between the two ostia, and this is the class in which the antrum acts as a reservoir for the frontal discharge.

Posteriorly and externally, the ostium frontalis is usually bounded by the walls of the ethmoidal cells. The anterior boundary is formed by the anterior nasal spine which may contain a cell. The posterior part of the inner wall may be in relation with the anterior portion of the olfactory fossa, from which it is separated by a thin plate of bone. This is the most dangerous locality, and no attempt should be made to enlarge the ostium in this direction. Therefore, anteriorly, the hard bone of the anterior nasal spine is encountered, while posteriorly and laterally, the friable thin bone of the ethmoidal cell wall is encountered, backed by the hard, thin bony plate of the inner table superiorly, about 1 mm. in thickness and the lacrimal bone and os planum laterally.

Here I may add that anatomically there is no such thing as a frontonasal duct.

I hope you will understand that this is only an outline of the anatomy, as there are several sources wherein this subject can be studied to better advantage.

Roentgen-ray plates are used, not only for their diagnostic value, but also to give the dimensions of the passage from the nose to the frontal sinus through the anterior ethmoidal cells.

The width of this passage varies from 7 mm. to 12 mm. (Watson Williams[2]).

An intimate knowledge of the surgical anatomy of the accessory sinuses and the nose should be gained from the cadaver before any attempt is made to open the sinus in the living.

Removal of the middle turbinate is about as far as one should go unless he is familiar with the many anatomic variations and relations in this region.

In the severer types of inflammation, the external operation by one who has mastered its technical details will give surer, quicker and safer results, especially in those cases in which the frontal sinus and the ethmoidal cells have large orbital extensions. One of the disadvantages of the present internal methods in severe cases is the uncertainty of results and constriction of the drainage passage into the nose, which occurs in nearly all cases a few weeks after the operation.

I am working on a flap procedure which I hope will overcome this tendency to constriction, which I will report on later.

In the internal methods in which burrs, chisels and rasps are used in this small and dangerous area, the procedure will lead to more accidents than when the sinuses are opened externally. Then, too, operating in an extensively diseased field differs greatly from the deadhouse work, as the disease has made it easier to enter the frontal sinus and also easier to invade the cranial cavity.

The types of inflammation may be divided, roughly, into two classes, first, those of polypoid degeneration, with thinning or absorption of the ethmoidal walls, and second, a thickening of the mucosa with a corresponding thickening of the ethmoidal walls.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Davis, W. E.: Nasal Accessory Sinuses, 1914.

2. Williams, Watson: Jour. Laryngol., Rhinol. and Otol., May, 1914, p. 225.

With both types there is more or less discharge, but the discharge is more apt to be greater with the latter type.

Indications for intranasal operation are all cases of chronic sinusitis in which there are no complications. About 95 per cent. can be treated by the internal method. Contraindications are intracranial and orbital complications and fistulas, all of which should be approached by the external route.

Of the several methods used to produce drainage of the frontal sinuses, those of Ingals,[3] Freer,[4] Mosher,[5] Vacher,[6] Watson Williams,[7] Halle,[7] and Good[8] are the most used. They all aim at the same result and nearly every one has special instruments for the purpose.

There has been considerable discussion about preserving the middle turbinate on the ground that the olfactory filaments on its inner surface, when divided, open a direct communication with the brain. Practically, this seems overcautiousness, as meningitis, when it occurs, starts from a perforation or fracture of the inner table.

Watson Williams, Halle, and Freer preserve the middle turbinate when possible. Mosher and Tilley[9] remove it. Many patients will recover with removal of the anterior portion of the middle turbinate alone, but for the severer types of inflammation the frontal ostium will need enlarging, and to accomplish this the route must be through the anterior ethmoidal cells.

The size of the passage through the anterior ethmoidal cells having been determined by means of the Roentgen-ray plates, supplemented by the estimated width between the turbinal plate, medically, and the internal canthus, laterally, the middle turbinate is removed to give freer access to the infundibulum and bulla. A probe can now usually be passed into the frontal sinus, which will determine whether its ostium opens into the recessus conchalis or into the recessus infundibularis.

The bulla ethmoidalis is entered with a straight curet, breaking down its cells and then coming forward, obliterating the frontal and infundibular ethmoidal cells as far as the frontal process of the superior maxilla will allow. No attempt is made to entirely clean off the orbital wall with the curet, as puncture of this wall may lead to hemorrhage or infection of the orbit, with the resulting danger to the eye. At this point a larger opening will be found into the frontal sinus, because some of the ethmoidal cell walls had formed part of the funnel-like floor of the frontal sinus about the ostium. Now changing from the straight curet to the angular curet and forceps of Grumwald, we clean the passage out and remove the remaining ethmoidal cells, and with the angular curet we enter the frontal sinus and work forward and downward in a safe direction.

This is as large as the opening into the frontal sinus can be made, unless the anterior nasal spine is taken away. The spine varies considerably in thickness. If it happens to be thin, it can easily be broken away with Myles' draw chisel, and if thick, it may be burred out, but I find that the resulting constriction from loss of the mucosa ultimately overcomes the advantage gained at the time.

For after-treatment I apply bismuth paste, douche with aqueous solution, and apply solutions of silver nitrate and sodium chlorid.

With an appropriate syringe I force cold bismuth paste into the sinus daily or as often as the condition warrants, replacing the secretion and some of the old paste with new paste at each treatment. I have found this the most satisfactory means of reducing the discharge and the swelling of the mucosa. There is no pain in the procedure, only a slight fulness for a few minutes from the pressure of the paste. As the discharge ceases, I change from the paste to white petrolatum, which melts at 90 F., and dilutes the paste remaining, and finally douche the sinus with normal saline solution, 115 F., which removes the remaining paste and petrolatum, if there is any. In a few instances in which patients have disappeared before the paste was removed I have found it in a well sinus at the end of a year, evidently producing no irritation. In some cases in which the sinus was subsequently opened externally the paste was found in one mass, helping what little drainage was present.

Douches of antiseptic solutions have been entirely abandoned. Normal saline solution is sometimes used, but the bismuth paste seems to give quicker results.

In very obstinate cases solutions of silver nitrate can be used, increasing the strength from 1 to 5 per cent., first anesthetizing the sinus, then passing a cannula into the sinus for the silver solution and at the same time another larger cannula into the nose for the solution of sodium chlorid and simultaneously filling the nasal cavity with salt solution and the sinus with silver solution, so that as the silver solution returns into the nose it is converted into silver chlorid and has no further action on the mucosa.

Failure of internal measures to give relief are sufficient indications to advise obliterating the sinuses by the external route.

15 East Forty-Eighth Street.

3. Ingals: Tr. Am. Laryngol. Assn., 1905.
4. Freer: Laryngoscope, December, 1915.
5. Mosher: Laryngoscope, September, 1911.
6. Vacher: Bull. Otol.-Rhinol.-Laryngol., 1911, xxiv.
7. Halle: Arch. Laryngol. and Rhinol., 1914, p. 73.
8. Good, R. H.: A Simple and Safe Operation on the Frontal Sinus by the Intra-Nasal Route, THE JOURNAL A. M. A., Aug. 31, 1907, p. 753.
9. Tilley: Jour. Laryngol., Rhinol. and Otol., May, 1914, p. 242.

EMPYEMA OF THE ETHMOID CELLS*

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Empyema of the ethmoid cells may be divided into acute and chronic, and the latter usually is followed by the latent.

The mucous membrane of the ethmoid is far more sensitive than that of the nose and consequently more readily succumbs to infection or to any kind of irritant; for that reason we find it so often affected when the nose is supposed to be the actual or natural habitat. Thus the ethmoid is always affected in hay-fever or any infectious disease involving the nose.

It is difficult to speak of ethmoid empyema per se, as such a condition probably never exists, at least it has never been demonstrated, the other sinuses being more or less involved; but it does not follow that treatment directed to the ethmoid will not relieve other contiguous cells as well. Empyema in early childhood is more amenable to treatment than that of the adult because of the small area involved, as well as the ready response of the tissues of the actively growing child. In fact, recovery is so common in childhood that empyema as an entity is commonly overlooked.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

The causes of suppuration of the ethmoid cells are various. They may be infected through the frontal sinus, antrum, sphenoid, orbital cellulitis, syphilis, foreign bodies or nasal mucous membrane, while the intensity of the infection varies with the virulence of the bacteria. The symptoms of a typical acute case are clogging of the nasal passages, pain which becomes intense on the slightest jar, often felt above the eyes more than elsewhere or on top of the head, dizziness and vomiting, prostration and delirium. The pain requires large doses of morphin and occasionally chloral added to induce sleep. It lasts until the discharge begins, when it is markedly lessened and only recurs at times by jerks. In four or five days the symptoms improve, except the discharge, which continues a week or two longer, when recovery seems complete. The recovery, however, is apparent only; in a large number of cases the sinus remains hypersensitive for years after. With drainage in acute empyema the nasal mucous membrane often becomes soggy with consequent obstruction to the free passage of air; if the pus is confined, pain may be very severe. These symptoms vary somewhat, depending on the severity of the infection.

In chronic empyema the mucous membrane becomes thickened by marked formation of fibrous tissue. There is a tendency to occlusion of the ostia through swelling of the membrane due to especial tenderness and looseness of the lining membrane, round cell infiltration, gradual proliferation of the epithelium, which in some cases is absent in spots, being replaced by granulation tissue (Skillern). In chronic empyema the most troublesome symptom is usually discharge with hawking and spitting, dry secretion in pharynx and sometimes crust formation in the nose. This discharge may be thick and pasty, clinging to the postpharyngeal wall or be blown out of the nose in large quantities. The most troublesome condition, however, is not during the most active suppurative stage but after the secretion has changed to mucopurulent or ceased entirely. A very large number of patients never recover completely. After suppuration has ceased, sometimes years afterward, the most troublesome symptoms occur. Now we find the mucous membrane in the cells so thin that it can only be detected microscopically and very often in my experience is absent altogether, in fact the cell wall has the appearance of "milk white." Polypi occasionally are found within the cells.

The after-symptoms induce the patient to seek the advice of the rhinologist. The most prominent symptoms we now encounter are the following: Headache over the bridge of the nose, or either side, or over the eyes and forehead, on top of the head, or base of brain, scotoma, inability to read but a few minutes, complaint of having hay-fever all the time, hawking and spitting during cold, damp weather, want of concentration, finally ending in neurasthenia. The pain descends toward the shoulder, or follows the course of some nerve branch remote from the seat of the disease. If pus is still discharging intermittently, pus cells only are found, or in some instances isolated cocci. General malaise, anemia, diarrhea, at times loss of appetite and even indican in the urine and deficiency in phosphates may be present. A most harassing symptom occasionally is cough without raising anything, which lasts four, six or even eight weeks; recurring once or twice each year. And in this condition, which I now designate latent ethmoiditis, is the time when the sensitive nerves manifest their irritability. But in a goodly number of patients we find vitality low, blood pressure below normal, heart sounds weak, especially the second. Some patients say they frequently catch cold which lasts several weeks; some sneeze periodically, others have watery discharge for days. Some complain of but one symptom, while others exhibit a number of them. They vary in intensity and degree. Comparatively few patients refer them to the nose. The symptoms vary from pain and semiannual discharge of pus, mucopus or watery substance, to cough, tracheitis, bronchitis, pain in the region of the stomach and abdominal distention with gas. The bacteriologic findings likewise vary. Commonly pus cells only are found, occasionally staphylococci, rarely pneumococci and seldom isolated groups of streptococci. In one case of succeeding attacks of subacute ethmoiditis, the influenza bacillus is always found. Some have dry throat and in one case accompanying pain with sleepiness.[1] Most of these patients are relieved by opening the cells and removing at the same time the middle turbinate bone. Occasionally puncturing the anterior cells will give instant relief of pain. Palliative treatment with cocain, epinephrin and antiseptic sprays or washes seldom relieves the symptoms. Although these cases seldom terminate fatally, suffering is often unbearable.

One patient with a history of thick discharge from the nose some years before had now this irritating result, coughing day and night for six weeks. Examination showed a latent sinusitis; but as there was also some burning sensation during micturition, I advised an examination of the urine, in which were found albumin, casts and blood cells. Treatment directed to this relieved all symptoms without operation.

A second case of chronic suppuration involved the antrum also, as well as frontal sinuses, with severe frontal headache. Here the urine was loaded with albumin; although the patient was suffering severely, I sent her home to have her physician treat her first.

A girl, aged 12 years, with orbital abscess, became totally blind in one eye before I saw her. The pus was evacuated, the involved antrum drained and she recovered without operation on the cells. Sight, however, was lost.

In another case, in which the disease involved the frontal sinuses and antrums, the bone was so softened that a sharp spoon easily penetrated to the brain. The brain was bathed in pus to the extent of half its surface. This was of course syphilitic. I have also seen epilepsy of recent origin and asthma both relieved by draining the cells.

In my cases I found chronic empyema more often bilateral than unilateral.

In consultation I have seen but four cases which terminated fatally, besides two private patients, both physicians. One of these, aged 27, with a previous history of suppuration, had an attack of scarlet fever; on the eighth day, while sitting up, he was suddenly attacked with pain. He made his own diagnosis, remembering his previous attack. He died the third day of meningitis.

The second patient was a physician, aged 35, run down from hard work. The cells had been drained a year previous to the attack. Pain was mostly in the forehead. The discharge was intermittent up to this time. He was seen by several physicians and surgeons. A diagnosis of meningitis was made. Decompression was done while the patient was unconscious but he died at the end of two weeks. All the fatal cases were meningitis, and the ages ranged from 12 to 35 years.

I have never seen caries in empyema except in syphilis. Twice I have seen epilepsy, and in two cases asthma of recent origin, all relieved by the ethmoid operation, one epileptic permanently. In all my cases I have had only two unilateral cases, and one of them was due to a foreign body which was in the nose for seven or eight years.

1. A chiropractic cured his sleepiness by hitting him on the back of the head (!) (neurasthenic).

COUNTY HEALTH ADMINISTRATION *

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Importance.—In the whole range of conservatism, there is probably no subject of greater importance at this time than that of county health administration. County health administration is important, first, on account of the size of the field, and second, on account of the stage of the development of the problem.

In size the field embraces approximately three thousand counties or rural governments in the United States. For 53 per cent. of the population of this country the county government is the nearest, the most direct, and the most responsive government; for this majority of our people the county or rural government is the nearest approach to the ultimate object of all government, to wit, intelligent self-control.

The present state of development of the county health government is embryonic, plastic, susceptible to direction. If organized influences, like that of this Association, if centralized agencies, like that of the federal government, the international health commission, and the state governments are to play a part in the development of an efficient county health government, now of all time is the time for action. Today county health administration is a twig; tomorrow it will be a well-formed or ill-formed limb.

Two Points of View and Two Methods.—One point of view of county health work is that of business efficiency; another is that of democratic administration. Business efficiency and democratic administration are not synonymous terms. Most of those who would establish county health work on a basis of business efficiency advocate a centralized form of health government; they advocate the direct or indirect appointment of the county official by the state officials, and they further advocate a large degree of control over the county official by the state officials. The majority of this group advocate, as a method for securing county health work, the enactment of state laws requiring all counties, or counties of certain wealth and population, to employ whole-time county health officers. Their method is that of conscription. On the other hand, those who would establish county health work on a basis of democratic administration believe in giving larger powers to the county authorities in both the selection and direction of their county health officer. This group, instead of appealing to state legislatures to enact bills requiring counties to do certain health work, advocates the direct appeal, through county campaigns, to the people of the county, with the hope of persuading the people to voluntarily assume their responsibility in the conservation of human life. Their method is that of the volunteer system. This group concedes that county health work will develop probably more slowly by this second method, but they maintain that when developed, it will have less of the weakness of the mushroom and more of the strength of the oak.

Two Kinds of County Health Work.—At present there are two kinds of county health work in process of development: first, the whole-time county health officer, and second, the unit system of county health work.

The whole-time county health officer scheme has as its principal advantage its relative stability as a means for accomplishing county health work. It has as its principal disadvantage the absence of a definite plan of work. This fundamental defect in the whole-time county health officer scheme is too much overlooked by the advocates of the whole-time health officer. In recent years we have heard much and read much about the whole-time county health officer, but, so far as I know, no one has as yet defined, written out in workable details, a plan of work for the whole-time county health officer. We have put the cart before the horse. We have advocated and obtained a structure before defining the function of the structure. Under natural law function precedes structure. Someone has said that the first article in the conqueror's creed is "Have a plan." The whole-time county health officer advocates have no plan of county health work.

The unit system of county health work lacks the continuity and the stability of the whole-time county health officer proposal. On the other hand, the unit system offers, primarily, an absolutely definite, clear-cut plan of work, and offers, secondarily, a means for executing the plan; moreover, the unit system is extremely flexible in its financial demands on counties, and is applicable to ten counties where the whole time health officer proposal is applicable to one.

The fundamental principles of the unit system are: (1) a division of the total county health problem into a number of smaller, independent health problems or units of health work, (2) the state's entering into a contract with the county to handle through its own agents one, two, three or more of the separate problems, according to a detailed plan for a specified county appropriation.

As an illustration, the typhoid problem of a county is independent of its tuberculosis problem, its contagious disease problem, its medical inspection of schools problem, its periodic medical examination problem, its malaria problem, and many other of the local health problems. One of the most effective and economical ways of attacking the typhoid problems of a county is to vaccinate a large number of the county people against typhoid fever. The vaccination protects those who have been vaccinated, and it educates others to resort to vaccination later when typhoid fever occurs in their neighborhood; moreover, in the county campaign for typhoid vaccination, a great deal of educational work against typhoid fever is carried on. Without entering into a description of the details of the plan, I may say that in twelve counties of one state in which this plan was carried out 52,000 people were given complete vaccinations. The average population of these twelve counties was about 25,000. An average of 4,300 people per county were vaccinated at a cost to the county of somewhere between $500 and $600. This year the same vaccination campaign is being carried on at a cost of $400 per county. This county appropriation pays about 80 per cent. of the actual cost of the work to the state board of health. I shall not here describe the details of the plan of campaign for typhoid vaccination; those who wish these details, forms, placards, newspaper articles, budget, etc., can get them for the asking.

Another unit of county health work that has been successfully carried out is a unit that provides a complete medical inspection of the schoolchildren of the county plus an extensive educational sanitary cam-

* Read before the Section on Preventive Medicine and Public Health at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

paign through the schoolchildren and the grown people of a school community. The state board of health can carry into effect this unit of county health work at an expense of about $10 for each school in the county, that is, in the average county, for an appropriation of from $400 to $600. Those who wish the details of this plan of work can get them by communicating with me.

There are other units of county health work in process of development. The federal children's bureau is undertaking to work out a county unit of infant hygiene work. Still another unit that will shortly be attempted is directed to finding the common diseases incident to the age period of from 30 to 60 in their incipiency and of educating the people as to the means for postponing the inception and progress of this important group of diseases.

The Relation of the Unit System to the Whole-Time County Health Officer.— First, the unit system provides those counties that cannot employ a whole-time health officer with an economic and effective means of dealing with their more important health problems until such a time when these counties can establish a more expensive and more comprehensive form of health government. Second, the unit system, by taking definite county health problems and finding effective ways in which to solve them, is going to have a most important influence in the development of a plan of county health work. I should not be surprised, in fact I expect to see the plan of the whole-time county health officer, when it is fully developed, consist largely of dealing with one or two of his health problems at different seasons instead of attempting to deal with all or most of his problems at the same time. The principal reason for believing that the unit system will devise the plan for the whole-time health officer is that the unit system begins with a plan and is carried out by specialists. For example, those who carry out the medical inspection unit do not carry on the infant hygiene unit, and vice versa. These men dealing with the several independent parts of the county health problem are in a much better position to devise and develop effective plans for dealing with different phases of county health work than the whole-time county health officer, who, in the nature of the case, has to be a general man.

ABSTRACT OF DISCUSSION

DR. JAMES A. HAYNE, Columbia, S. C.: The plan of allowing a county to decide whether it will have a county health officer or not necessarily carries with it the right to decide what kind of health officers they are going to have in that county, and what kind of laws they are going to have. As we know the individual, we know that he requires a good deal of prodding and a good deal of encouragement to do the right thing. And, if he is allowed to select his own driver, he is going to select a driver who is going to make him go very slow and do very little work. Whereas, if he has a driver picked out for him, a man who intends to get all he can out of the community and make it work, even for its own good, as hard as possible, we had better let the selection of that driver come from an intelligent central body rather than from an unintelligent proletariat.

DR. H. M. BRACKEN, St. Paul: Until recently I could not understand why Dr. Rankin was succeeding so well with county health organization in North Carolina. The county is the health unit in North Carolina. This makes it possible to approach the county officials with a business proposition to the effect that if they will spend a certain amount of money they can get a certain amount from the state. This is most helpful in securing county health organization. If I understand rightly, Dr. Rankin appears to be somewhat fearful now that health organization along certain lines is not entirely free from danger. This rather bears out the argument in favor of districting a state and gradually subdividing the districts until we reach the county as the final district. The district plan has a further advantage, for the number of trained health officers is at present too small to supply the demand if whole time county health officers were called for.

DR. J. N. HURTY, Indianapolis: I believe in the county unit. In Indiana we have been carrying on an intensified public health compaign for several years. In each county we have a county health commissioner. But he is a practitioner of medicine, and you know what that means. The time which he shall give to public health work is not prescribed. He gives just as much as he pleases, and most of them please to give very little, in spite of all the prodding that we can give them. In spite of the fact that they have taken a responsibility that they should fulfil still they raise the cry, "We are not paid enough." They will never be paid enough unless they are all-time health men. The county is the unit of state government in all the states, I believe. They levy their own taxes; they build their own bridges; build their own roads, and they conduct their own schools; and all of their departments report directly to a central state department. Why should we vary when we come to the health work. I will acknowledge that it would be a good thing to have district health officers, but it is better to have county health officers. In Indiana the present county health officers under the law are eligible for reappointment, but they must give up the practice of medicine and accept the situation and the pay, whatever that may be, that would be provided. There is also another provision that the officers who come hereafter shall be men who have passed a civil service examination, also a physical examination; they must be physically as well as mentally fit. They must not be addicted to drugs or to alcohol, and may be discharged if they ever become addicts. The appointing powers will be vested in a special board consisting of the county superintendent of schools, the auditor and the county treasurer. That board must appoint from the eligible list. We do not anticipate any trouble about securing officers, but the first set of officers will not be as good as we want, and they will not be all trained, but they will become trained in time.

DR. O. B. NESBITT, Gary, Ind.: At one time I was one of Dr. Hurty's county health officers, and I was also president of the local county medical society. That society appointed a committee on public health which got after the candidates for county commissioner and the candidate for mayor and brought about the union of the city and county health departments. That city had about 10,000 population, and the health officer's salary was about $300 a year; the county health commissioner was drawing about the same salary, and we were trying to maintain two departments. This committee decided that what we would get them to do would be to consolidate their departments, and then we would get an appropriation for a deputy that might be adequate to employ somebody who could carry on a little greater health work, and the salary for the combined commissioner might be sufficient for mere overseeing purposes. We did get an appropriation; we did bring about the union. A surgeon was appointed at the head of the department, and he was a very good man. We got a deputy health commissioner, and an appropriation from the county and city councils that enabled us to carry on what Dr. Hurty has said in his bulletin was quite a progressive little public health department. But, what happened? We had to change the deputy about three times the first year, because we did not have an experienced overseer, and the result was that the county council would not make any further appropriations.

Another example of small community work not well overseen is in the Lake County District in which I am now working. I am now devoting my time to the Gary public schools.

In that community we have several small cities and within the last three years we have had three public health laboratories develop in these small cities. Gary has had four laboratory men since the change of two years ago and not one of them has ever come out of a public health laboratory. They have come out of commercial laboratories, water laboratories, but not one of these men have had any general public health training unless it be a week or so in the state laboratory, or in a Chicago laboratory or something like that after they had been selected.

As I view it we stand in need of experienced district directors who in this instance would have charge of the health department development of the district. When the unit is too small it cannot be well supervised. We need people with public health vision and experience to take charge of districts who can develop a constructive work that will not prejudice the public, the business men and the people who have to do with the public funds.

DR. WATSON S. RANKIN, Raleigh, N. C.: The fundamental difference of opinion, I think, is whether in building up county health work we shall work from the state capital out or from the county in. In Illinois, with the district health officer plan, they are now spending $20,000 a year. When Illinois secures the forty-five district health officers which they estimate as the ultimate development of this scheme of local health work, the state will be spending something like $180,000 a year. The districts and counties in which they spend this money will be spending nothing. These counties will be doing nothing for themselves, but will be having their local work taken care of by state agencies. This is not the principle of local self-government, the foundation of a democracy. Now let us reverse this picture. Suppose that instead of appealing to the state, the general assembly, to provide for the local health work of the counties and districts we go to these districts and counties and, by educating them to the needs and value of health work, persuade them to appropriate their own money and to do their own work—in short, to take care of themselves instead of being taken care of by somebody else. This is democracy. This is what we all profess to believe. Dr. Hayne says that a division of governmental responsibilities and duties, working from the state government downward through counties, townships, and ultimately to the individual, is democracy reduced to an absurdity. So it is. But do we improve the situation by accepting the principle of centralization carried to its ultimate end? The individual yields to the township, the township to the county, the county to the state, the state to the nation, the nation to an international governmental agency, and we see that an absolute centralized government is as absurd as an absolutely decentralized government. We must strike the happy medium, the medium of practicability and common sense, the medium through which the individual and the local community are taught and encouraged to take care of themselves as much as possible and to be as little dependent on the state as possible. Dr. Hayne speaks of driving the people, or the legislature making them do. You cannot drive people. The greatest leader the human race ever knew and ever will know was significantly called a shepherd. You can educate and lead but you cannot drive. And it is more sensible to appeal direct to them and to persuade them to act and take care of themselves than by appealing to a legislature to attempt to force the people to act.

Prevalence of Syphilis.—Since February last the Wassermann test has been made on the serum of every patient admitted to the Boston Marine Hospital. Up to October 312 cases were thus tested, and seventy-seven, or 24.7 per cent., were positive. Readmissions and faulty specimens have been excluded from this series, and doubtful reactions have been considered negative. Of these seventy-seven, only nineteen were obviously syphilitic. Eleven cases obviously syphilitic gave a negative reaction because of recent treatment. Including these, the total incidence would be raised to 28.2 per cent.—*Public Health Reports*, No. 27, Nov. 24, 1916.

THE SCOPE OF INDUSTRIAL HYGIENE*

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Your committee was appointed at the last annual meeting to outline the immediate problems of industrial hygiene, and the relations of the medical profession to their solution. The importance of these problems is being increasingly recognized, not only because the lives and health of approximately thirty million workers are affected, but because the industrial development of the country is involved.

With the great development of modern industrialism, in which the mutual relations between master and man were replaced by the conflict between capital and labor, many senseless abuses, economic and social, arose. Among them may be mentioned insanitary environment in tenement and workshop, low wages and unreasonable hours, speeding up, seasonal occupation, unemployment, and the existence of a large labor reserve.

In addition to these abuses mention must be made of the stream of newer and unskilled labor, for which no proper and definite channels of distribution were provided.

Equally objectionable abuses by labor, on the other hand, such as strikes, accompanied by violence and intimidation, have also encouraged misunderstandings, with the result that a wasteful warfare has been permitted to continue more or less constantly, thus threatening our economic and social success, as well as the public health.

This unsatisfactory state of affairs, and especially the increasing economic pressure, has compelled the more thoughtful elements of both groups, stimulated by a growing public sentiment, to search for a remedy.

In studying the situation one fact stands out prominently, and that is that the great mass of the workmen has been denied the opportunity of enjoying, even in reasonable degree, healthful living and working conditions.

This situation has furnished a common ground on which all parties interested could meet and agree. As a result, the past decade has witnessed the development of industrial hygiene to a considerable degree, thus paving the way for further mutual adjustments and compromises.

It is obvious that no narrow conception of the field of industrial hygiene can be regarded as common ground on which capital and labor may meet or be expected to establish the modern counterpart of the former relation of master and man. It is the broader conception of the importance of the health of the worker which has introduced the physician into industrial management.

As Dean Marquis says, it is the duty of the factory doctor to promote understanding between employer and employee, to take drudgery out of labor, and to maintain interest in the individual, in other words, to

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put a soul into his corporation. The right man in this capacity will stamp out much bitterness and readjust human relations.

There is also an economic reason for the existence of an employees' service department, which will not only look after the physical needs, but also consider them in respect to mental and moral needs.

From the foregoing it is evident that a large field of opportunity is open to the physician in industry, but his professional and social value will depend entirely on his personality. If he would succeed, he must be able to deal with social as well as medical problems, in other words, deal with individuals rather than cases.

The scope of activities and opportunities of those engaged in industrial hygiene had perhaps best be outlined in the order in which it has been undertaken in industry, as follows:

1. First aid to the injured, followed later by complete surgical attention with maintenance of surgical hospitals.

2. The safety first movement, with consequent studies of the causes of injuries and the measures necessary for their prevention.

3. Inquiries into the physical status of workers in relation to accidents, and physical examination of workers. It was this latter activity by itself that aroused the opposition of organized labor, because physical examination per se merely eliminated the physically unfit without concern for their future health or welfare.

4. Medical supervision and care of employees, which marked the real step in the humanization of industry, because it gave the workman knowledge of his own physical defects, fitted him to jobs for which he was physically suited, and prevented overfatigue of body and mind.

5. Sanitation of places of employment, including water supply, sewage disposal, light, heat, ventilation, and personal comforts such as rest rooms, recreation, and luncheon service.

6. Sanitation of environment outside the workshop, including prevention of overcrowding and giving encouragement to the accumulation of property.

7. Consideration of the health and habits of the individual which makes for efficiency. In the event of a close enough personal relation having been established between the worker and the personnel of the employees' service department, advice in respect to personal habits and worries, domestic and financial difficulties will undoubtedly at times be sought with resulting benefit to all.

Helpful interest, looking to a prevention of alcoholism in the worker is another case in point. In fact, it is to intelligent industry, which refuses employment to the alcoholic and thereby places this problem on an economic basis, that we must look for a final solution of drunkenness.

8. Stimulation of interest in the formation of sickness and insurance societies, that is, mutual aids, and the establishment of old age pensions and death funds.

In addition to the above, those engaged in industrial hygiene within a circumscribed area have duties to perform outside that area. Cooperation with others in like fields is necessary and research must be undertaken in order to provide solutions of problems of national interest. Two of these are the prevention of alcoholism and the development of a system of mutual helpfulness by means of insurance.

Fortunately opportunity is presented for such cooperation through agencies, such as this section of the American Medical Association, and through the Association of Industrial Physicians recently formed. In addition the house of delegates of the American Medical Association is actively interested in a broad study of health insurance, in order that the whole medical profession may be prepared in due time to take its part in this matter.

At present for the most part the expenses of industrial hygiene are borne by the management. The workers who have a large degree of responsibility for health conditions are the recipients of the benefits, but do not share proportionately in the expenses. The public, too, benefits without sharing in the expense. It is therefore but just that these three groups which are responsible should meet their responsibilities by collective action under a well-thought-out plan of health insurance. An adequate health insurance system, national and state, when put in operation, will not only increase efficiency and enlarge the opportunities of the medical profession for good, but will also be a powerful means of reducing sickness and promoting health.

THE ABILITY OF BRAIN TISSUE TO TAKE UP WATER IN DELIRIUM TREMENS AND OTHER CONDITIONS

A STUDY OF CEREBRAL EDEMA*

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The presence of an edema of the brain in many instances of delirium tremens and its absence in many brains of patients dead of the same condition is well known. As yet, however, a satisfactory explanation of the presence or absence of this edema has not been found.

Following the enforcement of the Harrison Narcotic Law, many drug users turned to alcohol as a substitute. A notable increase in the number of patients suffering with delirium tremens has been the result, and the availability of a number of bodies for postmortem examination has prompted this study.

In considering this question it has seemed that two hypotheses are especially worthy of investigation: First, is the presence or absence of brain edema entirely dependent on conditions within the brain cells themselves? Or, second, is the presence of an edema dependent on the availability of fluid? That is, may the brains of delirium tremens patients be nonedematous in many instances because sufficient free fluid is not available to permit an edema? Determinations of hydration capacity of brain tissue offer a means of attacking this problem, and we have therefore investigated water absorption by brain tissues from people dead of delirium tremens and from other diseases. We have used normal brains as controls, these being from the bodies of persons dying suddenly from gunshot wounds, etc.

* From the Pathological Laboratory of Rush Medical College.
* Read before the American Association of Pathologists and Bacteriologists, Washington, D. C., May, 1916.

The histologic changes occurring in the brains of chronic alcoholics are well known. They include[1] vacuolization and high grade degeneration of the nerve cells with atrophy and shriveling, fatty infiltration of the medullary substance, dissolution of the chromatin structure, inflammatory infiltration of the pia and internal hydrocephalus. In delirium tremens, in addition to these changes, an edema of the leptomeninges is frequently present and most marked when coma or semicoma has preceded death for some time. Such patients are sometimes referred to as having a "wet brain." This edema is characterized by a distention of the meshes of the pia-arachnoid, whereas the brain substance itself may not contain a relatively marked amount of fluid.[2] It is this edema with which we are concerned.

TABLE 1.—DELIRIUM TREMENS

Case	Hours Dead Before Examination	Gain in Weight, per Cent.
1	12	92
2	10	82
3	12	52
4	30	75
5	32	64
6	21	62
7	15	86
8	48	72
9	19	52
10	23	74
11	31	63
12	19	73
13	25	86
14	24	65
15	2	52
16	26	61
17	22	65
18	2	56
19	24	86
20	12	90
Averages	21.1	70

Fresh human and rabbit brains were used in this work, the brain tissue examined always being taken from the temporal lobes. The causes of the death include a long list of diseases such as tuberculosis, pneumonia, meningitis (tuberculous and syphilitic), nephritis, acute surgical conditions, senility, heart disease, drug poisonings, cerebral hemorrhage and embolism, uremia, delirium tremens and sudden deaths from various causes. The rabbit brains were obtained from animals fed alcohol daily for several months, in doses sufficient to intoxicate them.

METHOD

In order to determine the power of the brain to imbibe water the following method was devised: One gm. of brain tissue, weighed accurately on a delicate balance, was placed in a test tube which contained 5 c.c. of methylene blue solution. The tube was then corked and placed in an ice box. At the end of twenty-four hours the tube was shaken and again replaced in the ice box. The methylene blue solution contained 10 grains of Grübler's methylene blue, dry powder, to each 200 c.c. of distilled water, making a 0.03 per cent. solution. At the end of forty-eight hours, the brain tissue was removed, as much fluid as possible being allowed to drain back into the test tube, and dried for five minutes on linen cloth. Then it was carefully weighed. The amount of water taken up by 1 gm. of brain tissue is expressed as a percentage. Thus, 1 gm. or 1,000 mg. of brain, after immersion in fluid forty-eight hours, weighed 1,623 mg. Six hundred and twenty-three mg. of water were taken up by the tissue, a gain of 62.3 per cent.

The methylene blue solution in which the tissue had been immersed was then placed in a colorimeter chamber and compared with a 0.03 per cent. solution of methylene blue. The degrees of decolorization of the methylene blue solution by different brains as read on the scale of the colorimeter, that is, the weight of the dye absorbed from a unit volume of solution by a gram of brain tissue, was found to vary in direct proportion to the weight of water taken up by the gram of brain tissue. But the whole range of intensity was between 25 and 30 on the scale, so that slight changes could not be determined with this method. For this reason more dependence was placed on the amount of water taken up by the brain tissue at the end of forty-eight hours, since this was accurately determined by weighing. The tissues were allowed to remain in fluid forty-eight hours because it was learned that no more water was absorbed after that time.

RESULTS

Brain tissue from approximately 150 bodies was studied in this manner. Tables have been made by placing the results obtained with brains from people dying of pneumonia in one group, of delirium tremens in a second group, etc. Finally one large group of forty concerns patients dead of various diseases, such as heart trouble, senility, tuberculosis, etc. The number of hours that elapsed between death and the time the tissue was placed in fluid is recorded for each.

In determining how much water a normal brain will absorb when immersed in fluid forty-eight hours, we have used as controls the six instances of sudden death in Table 3. From the circumstances under which death resulted and from the postmortem examinations, one may justly assume that they were normal brains.

TABLE 2.—GENERAL DISEASES

Case	Hours Dead	Gain in Weight, %	Causes of Deaths
1	22	58	Generalized miliary tuberculosis
2	72	67	Secondary anemia
3	25	63	Gunshot wound of the trunk
4	7	86	Senility
5	7	65	Fracture of femur unhealed with gangrene
6	24	60	Suppurative peritonitis
7	24	70	Heart disease
8	6	62	Postoperative peritonitis
9	29	56	Gangrene of lung
10	48	66	Suppurative otitis media
Average (40 cases)	21.3	64.5	

The average amount of water taken up by 1 gm. of each of these brains in forty-eight hours was 645 mg., or 64.5 per cent. of the original weight. Thus 64.5 per cent. increase in weight is the increase which we may expect in a normal brain under the given conditions. The average increase in weight of the brains from general diseases, Table 2, was almost identical, 64.6 per cent. From this one may infer that the general diseases included in Table 2 have practically no influence on the factors which determine how much water the brain tissue will absorb. Brain tissue from persons dead of delirium tremens (Table 1) took up

1. Alzheimer, quoted by Bumke: Handbuch der Neurologie von Lewandowsky, 1912, iii, 1027. Braun: Ueber die Experimentelle durch chronische alkoholintoxikation hervor gerufenen Versanderungen in central and peripheren Nervensystem, Tübingen, 1899.

2. Le Count, E. R., quoted by Sceleth and Beifeld: Cerebral Edema in Chronic Alcoholism, Am. Jour. Med. Sc., 1915, cxlix, 881.

6 per cent. more water than either of these groups. Brain tissue from persons dead of cerebral embolism, cerebral hemorrhage and uremia gained 73.5, 74.3 and 71 per cent. in weight, respectively. The initial percentage of water in these brains at the time of study was not determined, so what percentage of water was imbibed per gram of dry substance cannot be stated; but in 45 per cent. of the higher coefficients of water absorption the tissues were already edematous, which would suggest that the increase of weight reckoned on the basis of dry substance would have been similar.

TABLE 3.—SUDDEN DEATH

Case	Hours Dead	Gain in Weight, %	Causes of Deaths
1	34	76	Stab wound of heart
2	34	79	Asphyxia; stenosis of larynx
3	11	80	Gunshot of the trunk
4	36	55	Rupture of heart aneurysm
5	12	55	Gunshot of brain
6	27	48	Thrombosis of coronary artery
Average	24	64.5	

The possibility of colloids playing a rôle in the absorption of water by plants was first suggested by W. Pfeffer,[3] Hofmeister,[4] and Durig;[5] and Paule[6] expressed similar views with reference to the swelling of animal tissues. Since that time much evidence has accumulated to show that the colloidal condition of the substance in a cell is chiefly responsible for the amount of water held by that cell.[7] Fischer[8] has demonstrated that the absorption of water by nervous tissues (brain and spinal cord) is analogous to the absorption of water by protein colloids. He has also emphasized that increase in acid content of protein gels such as gelatin and fibrin results in a swelling of the colloid if water is available. The higher the concentration of the acid, up to a certain point, the greater will be the swelling, other factors, such as salt concentration, etc., remaining the same. Thus it has been shown that the acid content of a protein jelly is one of the chief factors in determining the degree of imbibition of water by that colloid.

If we accept Fischer's conception that an increased acid content in a tissue is the common determining factor in increased hydration capacity, the results obtained in this work are very tangible. It has been fairly established that any interference with the respiration of a cell, that is, any condition tending toward an asphyxia of that cell, results in an increase in the acid content, the increase depending on the degree of asphyxia. Therefore, we should expect brain tissue to take up the largest amounts of water in those conditions in which the highest degrees of cell asphyxia occur. Morphin, in sufficient doses, produces cell asphyxia with acidosis. In this connection it is interesting that brain tissue from one case of morphin poisoning examined by us took up 84 per cent. of water.

Cerebral hemorrhage and cerebral embolism gave the next highest results in our tables, an increase in the water content of 74.3 and 73.5 per cent., respectively. In these conditions an extreme interference with the cerebral circulation was present, and this must have resulted in a severe cell asphyxia.

In uremia the brain tissue increased 71 per cent. in weight. This high percentage of water absorbed is also capable of interpretation as due to acidosis known to occur in this condition. In one of these instances death was due to an occluding thrombus in each renal artery.

Brain substance from seven cases of pneumonia gave an average increase in weight of 66.3 per cent., sixteen cases of skull fracture 68.7 per cent., two cases of tuberculous meningitis 66.5 per cent., and for three cases we can offer no explanation of the slight avidity for water shown by pieces from the brains, all possessing evidence of a syphilitic infection; their average was 51.7 per cent. The following are brief accounts of these cases:

CASE 1.—*History.*—H. W., man, aged 35, became unconscious suddenly in bathroom, and when seen by Dr. C. W. Courtright, to whom we are indebted for this information, the patient was paralyzed, speechless, the left arm and right leg motionless, eyes staring, "right arm across the chest and spastic, left thigh raised with leg flexed and at times slightly extended and then again flexed, feet extended on the ankles and spastic with toes drawn up." Apparently he could not hear and gave no evidence of consciousness.

Three days later he was admitted to the Cook County Hospital to the service of Dr. Vaughan, and a diagnosis of meningitis was made; but the cerebrospinal fluid was found clear and with positive Nonne and Noguchi reactions for syphilis. Death occurred at the end of twenty-four hours of unconsciousness in the hospital.

Anatomic Diagnosis.—Syphilitic leptomeningitis; marked edema of the brain; general anemia; lumbar needle puncture wounds; slight sclerosis of the basilar arteries and aorta; hyperplasia of Peyer's patches in the bowel; multiple minute gummatous scars in the periphery of the liver; nearly empty bowel; slight hyperplasia of the thyroid gland; slight sordes of the tongue; slight atrophy of the spleen; hypostatic hyperemia and edema of the lungs; moderate atrophic emphysema of both lungs; hypostatic hyperemia of the mucous membrane of the pharynx, stomach, esophagus and rectum; slight fibrous thickening of the pleura at the apex of the right lung; adventitious fibrous adhesions between (1) the under surface of the liver and the tissues in front of the right kidney, and (2) the mesosigmoid and the left wall of the abdomen; coal-dust pigmentation of the lungs; carious and dirty teeth with absence of some; retrocecal appendix vermiformis; postmortem bruises on the right thigh; postmortem autolytic softening of the myocardium; postmortem digestion of the lining of the esophagus.

Description of the Brain.—The leptomeninges are thickened and opaque with milky white fibrous thickenings dipping into the sulci and along the vessels, and raised by fluid under them. The thickenings are especially marked in both the right and left frontal lobes, in the sylvian fissure and in the postcentral and precentral gyri.

TABLE 4.—SPECIAL DISEASES

Disease	Number of Cases	Average Hours Dead	Gain in Weight, per Cent.
Uremia	2	40	71
Pneumonia	7	19	66.3
Skull fracture	16	21	68.7
Tuberculous meningitis	2	19	66.5
Syphilitic meningitis	3	27.7	51.7
Cerebral embolism	6	35.5	73.5
Cerebral hemorrhage	9	15.8	74.3
Morphin poisoning	1	13	84

3. Pfeffer, W.: Pflanzen Physiologie, 1897, i, 116.
4. Hofmeister: Arch. f. exper. Path. u. Pharmakol., 1891, xxviii, 210.
5. Durig: Arch. f. d. ges. Physiol. (Pflüger's), 1901, lxxxv, 401.
6. Paule: Ergebn. d. Physiol., 1907, vi, 126.
7. Pribram, E.: Kolloidchem. Beihefte, 1910, ii, i. Bechold, H.: Kolloide in Biologie und Medizin, Dresden, 1912. Arnold, R.: Kolloidchem. Beihefte, 1914, v, 411. Traube: Arch. f. d. ges. Physiol. (Pflüger's), 1911, cxi, 109. Klose, H.: Arch. f. Kinderh., 1910, iv, 43. Potzl, O., and Schuller, A.: Ztschr. f. d. ges. Neurol., 1910, iii, 321.
8. Fischer: Kolloid-Ztschr., 1912, x, 292. Oedema and Nephritis, New York, J. Wiley and Sons, 1915.

The left occipital lobe is pigmented a dark reddish brown, especially on the mesial portion.

The arteries of the base of the brain are white, glistening, thickened and gaping.

The lateral ventricles are slightly distended, and measure 8 mm. transversely from the anterior commissure.

The surfaces made by sectioning are pale.

CASE 2.—*History.*—H. M., aged 35, became ill soon after sentence to the house of correction for larceny, with a delirium thought to be delirium tremens which developed into unconsciousness and death at the end of three weeks. There was no history of alcoholism.

Anatomic Diagnosis.—Acute emaciation; slight diminution in the yellow material of the suprarenal glands; edema of the brain; focal atrophy of the cerebral cortex; healing abrasion of the right leg; superficial decubital ulcer of the sacrum; mucopurulent left otitis media; moderate hyperplasia of the solitary lymph nodes of the bowel; hypostatic hyperemia of the mucosa of the small bowel; miliary gummatous scar of the liver capsule; syphilitic scars of the leptomeninges and legs; syphilitic (?) scars of the spleen; syphilitic (?) atrophy of the right testicle; slight diffuse syphilitic (?) sclerosis of the liver; slight syphilitic sclerosis of the aorta; healed thrombo-ulcerative aortic endocarditis; bile-stained mucous lining of the small bowel; carious "fanglike" teeth; absence of many teeth; fibrous pleuritis; fibrous adhesions between the cecum and the front wall of the abdomen; stellate scar on the left side of the mesosigmoid; marked coal dust pigmentation of the tracheobronchial lymph glands; exposure pigmentation of the skin; scar of the left forearm; supra-arterial subepicardial fibroid nodules; pedunculated, partially necrotic, appendix epiploica; persistent, membranous eustachian valve; bile staining of the esophageal lining.

Description of the Brain.—There is a pit in the right postcentral sulcus 2.2 cm. long by 1.2 cm. wide by 0.6 cm. deep. The gyri around this pit are narrower and more rounded than normal. There are similar pits in the right and left fissures of Rolando. The sulci of the superior surfaces of both frontal and parietal lobes are wider, and gyri are narrower and more rounded than normal.

There is an irregular whitish thickening 2 mm. in diameter in the leptomeninges over the ascending limb of the right sylvian fissure. There are similar whitish thickenings in the left superior, middle and inferior frontal sulci and in the right fissure of Rolando.

On the surfaces made by sectioning the brain in the usual way the cortex is bluish gray, and the cavities of the lateral ventricles are slightly compressed.

CASE 3.—*History.*—F. F., man, aged 36, entered the Cook County Hospital to the service of Dr. Loeb. He was a painter and had always been healthy until during the past year, when he became forgetful and nervous, and this was attributed to an injury of the head received by a fall from a street car. He was found unconscious on the street and brought to the hospital in coma. The spinal fluid was clear, under increased pressure, with positive Nonne and Noguchi tests for syphilis and a high cell content. From certain physical signs a diagnosis of mitral and aortic stenosis was made as well as "meningitis probably of syphilitic origin."

Anatomic Diagnosis.—Nodular (hyperplastic) syphilitic leptomeningitis; marked syphilis of the aorta; gummas of the liver; scar of the penis; scars of the right leg, left knee, and sacrum; lumbar needle puncture wound; goiter; bruise of the lumbar region; work-worn hands; vaccination scar of the left arm.

Description of the Brain.—Over the frontal and parietal lobes the thickening of the arachnoid and pia hide the contour of the convolutions. It is more spread out and thicker than the discrete gummatous scars which more commonly remain in the leptomeninges as evidence of a syphilitic infection.

The increased water absorption in the skull fracture group was undoubtedly due to circulatory interference from the torn vessels, blood clots, compression and laceration of brain tissue, frequently present. In pneumonia and in tuberculous meningitis it is possible that an increase in the absorption of water does not occur because antemortem factors tending to produce cell asphyxia are not present.

In delirium tremens there are probably at least three factors concerned in the absorption of water by the brain colloids. First, alcoholism has a detrimental influence on the brain, as evidenced by the atrophy[9] which occurs in the cortex of chronic alcoholics.[10] This may lead to impairment of circulation, asphyxia, etc. Secondly, cardiac weakness plays a rôle in chronic alcoholism. When of sufficient degree, cardiac weakness results in a deficient blood supply to the brain, and thus cerebral respiration is still further interfered with. Finally, alcohol is a narcotic. Like other narcotics it may produce a cell asphyxia directly. Alcohol or its derivatives have been demonstrated in the spinal fluid of alcoholics,[11] and twenty-four hours are required for their elimination from the spinal fluid following a debauch, according to Demole.[12] Grehant[13] gave a dog 58 c.c. of absolute alcohol and bled it to death at the end of four hours. By quantitative methods he recovered a larger quantity of the alcohol from the brain than from the muscles, liver, kidneys, or any other tissue of the body. This intimate contact of alcohol with the nervous tissue permits a maximum local effect.

TABLE 5.—RABBIT BRAINS

Case	Time Intoxicated Daily, Months	Hours Dead	Gain in Weight, per Cent.
1.	4	1	101
2.	4	2	81
3.	1½	12	62
4.	2	12	76
5.	3	12	74
Average	.....	8	78.9

Will chronic alcoholism in laboratory animals effect a similar behavior of the brain colloids? One of us (F. N.) fed many rabbits with alcohol through a stomach tube in gradually increasing doses in an endeavor to produce delirium tremens. This has been attempted by many investigators but has been uniformly unsuccessful, excepting perhaps in the single instance of Braun.[14] He believes he produced the condition in a dog. But Friedenwald[15] kept rabbits alive for long periods, the animals receiving sufficient alcohol each day to produce intoxication, with nothing, however, resembling delirium tremens.

Five of our animals ceased feeding, underwent marked emaciation, became extremely weak, and finally died, after having been intoxicated daily from one and one half to four months. These symptoms have been referred to by Friedenwald as characteristic of chronic alcoholism in rabbits. Intercurrent infections killed many of our animals, but these have been omitted from the series for obvious reasons. A gross

9. Atrophy of the cerebral cortex, aside from being frequently found at postmortem examinations on chronic alcoholics, has also been observed in the cortex of rabbits fed alcohol over considerable periods of time (Lissauer, M.: Experimentelle Leptomeningitis bei chronischer Alkohol vergiftung, Centralbl. f. allg. Path. u. path. Anat., 1913, xxiv, 337).

10. Wassermeyer: Arch. f. Psychiat., 1908, xiiv, 861.

11. Schottmüller and Schumm: Nachweis von Alkohol in der Spinalflüssigkeit von Saufern, Neurol. Centralbl., 1912, xxxi, 1020.

12. Demole: Alcool et delirium tremens, L'encephale, 1914, ix, 7.

13. Grehant: Recherches sur l'alcoolisme aigue: dosage de l'alcool dans le sang et dans le tissue, Compt. rend. Acad. d. sc., cxxix, 746.

14. Braun, cited by Bumke: Die exogenen Vergiftungen des Nervensystem, Handbuch der Neurologie von Lewandowsky, 1912, iii, 821.

15. Friedenwald, Julius: The Pathologic Effects of Alcohol on Rabbits, THE JOURNAL A. M. A., Sept. 9, 1905, p. 780.

edema of the brain was never observed in these animals. But the brain substance, when treated by the same method as the human tissue, gave an average increase in weight of 78.9 per cent. as compared with 70 per cent. increase in control rabbit brains when alcohol was not given. This increase, which is even greater than that of human brains is, we feel, very significant, and strongly suggests that similar factors may have caused the increased postmortem hydrations of both rabbit brains and brains of human alcoholics.

Assuming that the increase in the water content of the brain colloids during their immersion in fluid is dependent on the presence of acid in the cells, it is difficult to determine what proportion of this acid was present before death and how much was formed postmortem. Lactic acid can be detected in tissues from one to two hours after death, and gradually increases in amount for many hours. Other organic acids are also present. It would seem, however, that provided the time elapsing between death and the examination of the tissues was equal in several instances and the conditions under which these tissues were examined were uniformly the same, the formation of lactic and other postmortem acids would also be about equal. In that event the preformed acid and the antemortem conditions in the tissues would be responsible for the differences in the amount of water imbibed by the tissues we have studied, and it is with the antemortem conditions that we are especially concerned.

It was, of course, impossible to obtain our material at a given time after death. Therefore, the average number of hours elapsing between death and the time of examination has been recorded for each group in the series. The average elapsed time for delirium tremens was 21.1 hours, general diseases 21.3 hours, sudden death 24 hours, skull fracture 21 hours, cerebral hemorrhage 15.8 hours, etc. Thus for many of the groups which have been compared, the number of hours the tissues have been dead is almost identical.

The results indicate that in the brains taken from persons dead of delirium tremens there is morphologic evidence of an increased amount of fluid which may in one case be locked up in the brain tissue, and in another, free within the meshes of the pia-arachnoid. This is suggestive possibly of different phases of the same fundamental process. This accords, to some degree at least, with work recently done by Steinbach.[16] In delirium tremens he found an increase in the pressure and the amount of the spinal fluid. In some instances he withdrew as much as 100 c.c. of fluid with no ill effects. He thinks this increased pressure is responsible for the onset of delirium, and his arguments are based on the beneficial effects of early lumbar puncture on the delirium.

Caution must be exercised in the explanation and application of these results, since many factors are involved and about some of them little is known. We believe, however, that the following statements may be fairly made:

SUMMARY

1. A gross edema of the leptomeninges, "wet brain," was present in 45 per cent. of the brains used in this study.

2. The brains of twenty persons dead from delirium tremens, removed from the body on an average twenty hours afterward and immersed in distilled water for forty-eight hours, show hydration capacities exceeding those observed in any other condition encountered among 130 miscellaneous necropsies, with the exception of three instances of uremia, one of morphin poisoning, and those of cerebral embolism and hemorrhage.

3. The brains of rabbits dead of experimentally produced chronic alcoholism (daily intoxicating doses of alcohol by stomach for from two to four months) were not grossly edematous but possessed a postmortem hydration capacity even greater than that of human brains, and 8 per cent. in excess of normal rabbit brains.

4. These indications of an alteration of the hydration capacity of the brain colloids may be assumed to be the result of tissue asphyxia and the resultant accumulation of acids secondary to the action of the narcotic alcohol.

5. Such an interpretation is in some measure supported by the very high hydration capacity observed with uremia in which clinically an acidosis is known to exist.

122 South Michigan Avenue—6026 Kenwood Avenue.

16. Steinbach: Ueber die Zerebrospinal Flussigkeit und über die Wirkung der Lumbalpunktion beim Delirium Potatorum, Deutsch. med. Wchnschr., 1915, p. 369.

TREATMENT OF ACUTE ALCOHOLIC DELIRIUM *

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Through the kindness of Dr. Alanson Weeks, Chief Surgeon of the Emergency Hospital Service in San Francisco, all the patients with delirium tremens in that institution during the greater part of last year were turned over to me for observation and treatment.

After a few months' observation I found that practically all those with the severer types were suffering from an acid intoxication and the conclusion was forced on me that any line of treatment, to be efficient, must dilute and neutralize the effects of this intoxication and favor its rapid elimination.

Alcohol belongs to the group of the hydrocarbon narcotics, and while it affects all types of tissues it has a selective action for the fats of the nervous system and liver.

The severe types of delirium that have come under observation have all given evidence of a severe acid intoxication, and the method that I am about to suggest for the handling of this class of cases is based on the study of sixty-four personally treated patients. The patients treated represent the most severe types that came under observation, the simple drunks and the mild delirium cases not being included.

Whether it be alcohol or the altered metabolism produced by alcohol in the human body, the symptoms present represent the effect of this toxic material in the nervous system and liver, and the pathologic changes present may be anything, from simple edema to severe degenerative changes of the fatty type. It must be evident that any treatment, to be of service, must be used in the stages of edema. After experimental work with various salts that have the power of dehydrating edematous tissues, I devised a mixture of sodium bromid, sodium chlorid and sodium bicarbonate that could be used in large quantities intra-

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venously without producing the toxic effect of bromid as ordinarily given in large doses. As the severe types also suffer from a starvation acidosis, glucose in high concentration was also used intravenously; this not only furnished an available carbohydrate that was readily utilized by the body, but in 30 per cent. concentration produced marked dehydrating effects on the central nervous system.

Time will not permit me to give the histories of all the cases, but I will detail two in which recovery took place as illustrative of the general methods followed. A table shows the results in all the sixty-four cases.

CASE 22.—J. O. L. was brought to the Central Emergency Hospital Jan. 2, 1916, at 4:10 p. m., with a diagnosis of alcoholism with epileptiform convulsions. His brother stated that he had been drinking heavily for years. He went from one convulsion into another after entrance. I first saw him on Jan. 3, 1916, at 9 p. m. He was still having convulsions and could not be roused. It was necessary to keep him in restraint. Blood pressure at this time was 118. I gave him 1,000 c.c. of the following mixture intravenously: sodium bromid, 10.2 gm., sodium chlorid 5.8 gm., sodium bicarbonate 8.4 gm., and sterile tap water 1,000 c.c. He was so delirious that it was necessary to keep him in restraint during the administration of the solution.

The urinary examination made before treatment showed a high degree of an acid intoxication, with specific gravity 1.030; reaction acid 10^{-4}, albumin a trace, sugar none, indican marked increase, urobilin increased, urea 20 gm. per 1,000 c.c., ammonia 2.59 gm. per 1,000 c.c., ratio 1 to 7, acetone triple plus, diacetic acid triple plus, hyaline and granular casts present.

On the following day the delirium was less, but it was still necessary to keep the patient in restraint. Urinary examination showed a drop in ammonia from 2.59 gm. to 0.84 gm., but it was still heavily charged with acetone and diacetic acid. Every two hours 1,250 c.c. of a 2 per cent. sodium bicarbonate and 6.4 per cent. glucose solution were given. By 2 a. m. the patient was sleeping soundly. Urine examined after the last intravenous injection, and on Jan. 7 (the day of discharge) showed absence of albumin and indican, ammonia down to 0.64 gm. per liter, no acetone and no diacetic acid. The patient was eating and sleeping well and the tremor was gone. He was discharged on the morning of January 7.

CASE 1.—E. C. A. was brought to the Central Emergency Hospital Jan. 13, 1916, at 5:35 a. m., having been removed from a private hospital where he was receiving treatment for the liquor habit, they being unable to handle him. He was screaming, bit and scratched the attendants, and had to be placed in restraint.

His blood pressure before treatment was 138 and afterward 140. Examination of the urine showed a specific gravity of 1.032, reaction acid 10^{-4}, albumin large amount, sugar none, indican and urobilin increased, urea 10 gm. per 1,000 c.c., ammonia 1.4 gm. per 1,000 c.c., acetone triple plus, diacetic acid triple plus, hyaline and granular casts present.

At 10 a. m. he was given, intravenously, 1,000 c.c. of the following mixture: sodium chlorid 5.8 gm., sodium bicarbonate, 8.4 gm., sodium bromid 10.2 gm., and sterile tap water 1,000 c.c. This was followed by glucose, 80 gm. in 250 c.c. of tap water. The two injections were made slowly, taking thirty-five minutes. There was no chill. He felt better and was out of restraint in one hour. Shortly afterward he asked for food and consumed two quarts of milk before 5 in the same afternoon. He slept all night, had no return of delirium, and returned to his home within twenty-four hours of the time we first saw him. The urine examination after injection was as follows: specific gravity 1.024, reaction alkaline to rosalic acid, albumin none, indican a trace, urea 15 gm. per 1,000 c.c., ammonia 0.77 gm. per 1,000 c.c., acetone a trace, diacetic acid a trace. After discharge I saw him daily for three days. There was no return of the delirium or the tremor.

These two cases are representative of the most violently delirious types that came under my care. Both patients had been drinking heavily for a long period and were ingesting little or no food.

I have followed this method of treatment in sixty-four cases, treating and observing them all personally. The results obtained are shown in the table.

It will be noted in the table that blood pressure readings have been obtained in fifty-three out of the sixty-four cases. You may note that in the cases showing an abnormally high pressure this was reduced despite the fact that the volume of the circulating blood had been increased. It has been maintained that intravenous injections of alkali and salt are dangerous because they raise the blood pressure, but here the opposite effect is shown. In a previous communication[1] I have shown that despite the fact that the volume of the circulating blood is increased in these conditions of high blood pressure, if a proper solution be used it is possible to dehydrate the blood and other tissues of the body. If the amount of salt in combination with the water injected is in excess of the normal concentration, it will diffuse into the tissues of the body and liberate water from them. If the salts in solution be sufficiently concentrated, more water may be given off than was injected. The effects of such a procedure are obvious. Not only are all the tissues of the body dehydrated, but the circulating blood as well. If an edema has been existent anywhere in the body it will therefore tend to be reduced, or, to apply it to this work, if there has been an edema of the brain, this edema tends to become reduced. At the same time, that portion of the high blood pressure which has rested on such an edema of the brain will also be reduced. The blood also shrinks under the influence of the salt, as do the more solid colloids of the body. This shrinking of the blood colloids means a decrease in the volume of the circulating blood, and this is again followed by a fall in blood pressure. As you will note, the perfusion mixture used contains over 24 gm. of sodium bases to the liter and is markedly hypertonic. The same holds true with reference to the use of glucose. With every increase in the concentration of glucose in the perfusion mixture there is an increase in its power of dehydrating the body colloids. Both these solutions are so prepared that they do not produce hemolysis, and the association of the chlorin with the bromin ions prevents the toxic effect of the latter.

A brief outline of the histories of the fatal cases may prove of interest.

CASE 58.—Mrs. C. was brought to Central Emergency Hospital at 7:25 a. m., March 10, 1915, with diagnosis of abrasions on head, elbow and back, and acute alcoholism. She was picked up on the street and evidently had been run down by an automobile. She had a severe tremor, with low muttering delirium, and could not be roused to give an account of herself.

Treatment: She was given 2,000 c.c. of the bromid mixture, intravenously. This was followed by a severe chill and cyanosis. She died in four hours.

Postmortem revealed subdural hemorrhage, minute hemorrhages in meninges, a large fatty heart and fatty liver.

CASE 59.—C. A. was brought to Central Emergency Hospital at 9:30 a. m., April 16, 1916, with diagnosis of alcoholism with epileptiform convulsions. I saw him at 1:55, he having been in a stupor all morning. The temperature was subnormal with râles over both bases. He was stimulated with digitalis, strychnin and caffein without result. At this time the patient was comatose. The blood pressure was 200 systolic, 120 diastolic. The urine was solid on boiling.

1. Hogan, James J.: On the Alleged Dangers of Intravenous Injections in High Blood Pressure, Lancet-Clinic, Jan. 2, 1915.

He was given 1,800 c.c. bromid mixture, following which the blood pressure was 180. The patient did not regain consciousness and died the following morning at 6:10. The coroner's physician reported the death due to pulmonary tuberculosis.

CASE 60.—L. J. was brought to the Central Emergency Hospital at 7:25 p. m., March 14, 1915, with diagnosis of acute alcoholism with septicemia and diffuse cellulitis of both legs.

I saw him for the first time the following morning at 10:35. He was then so delirious that he had been placed in restraint. He was perspiring profusely and talking in an incoherent manner. He did not answer questions. The blood pressure was 106 and he was in profound shock.

He was given intravenously 1,000 c.c. bromid mixture. As soon as this was finished, restraint was removed and he sat up and drank a cup of milk, which he held in his hands. At 11:20 he was able to tell his name and tell us that his feet were still tied down. Within an hour he became delirious again. His temperature was 102.6, his blood pressure fell to 90, so we gave him 1,000 c.c. of 2.5 per cent. gelatin mixture, intravenously. The delirium subsided gradually, but he slowly sank and died March 22 at 1 p. m. The coroner's physician reported death due to bronchopneumonia.

CASE 61.—A. P. was brought to the Central Emergency Hospital at 2:30 p. m., March 29, 1915, with a diagnosis of acute alcoholism.

I saw the patient first at 5:50 p. m. He was in a wild delirium, seeing things about the room, and imagined that someone had cut off his moustache and removed all his bar fixtures. He had a temperature of 100 and was suffering with an infection of the foot.

Treatment: He was given 2,000 c.c. of the bromid mixture, intravenously. Before giving it the blood pressure was 138 and directly after it was 140. This relieved his wild delirium but his temperature kept up and he was removed to the San Francisco Hospital, where he died.

Postmortem: The coroner's physician reported death due to chronic endocarditis and bronchopneumonia.

CASE 63.—F. W. W. was brought to the Central Emergency Hospital Jan. 14, 1916, at 10:35 a. m., with a diagnosis of chronic alcoholism.

I saw him Jan. 16, 1916, at 9:25 p. m. He was talking incoherently, with a low, muttering delirium. The blood pressure was 150.

Treatment: He was given intravenously 1,000 c.c. of the bromid mixture. There was no improvement in his condition,

CONDENSED REPORT OF SIXTY-FIVE CASES

Number	Name	Pulse	Respiration	Temperature	Delirium	Tremor	Physical Condition	Blood Pressure Before	Blood Pressure After	Condition on Discharge	Time Detained, Days	Sodium Bromid Solution, C.c.	Glucose
1	E. C. A.	88	24	98	+++	+++	Restrained	138	140	Good	1	1,000	250 c.c.
2	A. R.	88	20	98.6	++	+++	Not restrained	104	124	Good	1½	1,000	250 c.c.
3	J. R.	100	22	98.8	.....	+++	Not restrained	142	110	Good	2½	1,000	
4	J. S.	90	20	98.6	++	++	Not restrained	118	118	Good	1½	1,000	
5	E. F. R.	88	24	98.4	.....	++	Not restrained	136	125	Good	1	1,000	
6	C. R.	90	20	98.6	.....	++	Not restrained	136	125	Good	3½	2,000	
7	W. D. S.	100	20	98.4	++	++	Not restrained	150	150	Good	1	1,000	
8	J. W.	88	22	99	+++	+++	Restrained	....	....	Good	6	1,500	
9	J. C. C.	90	20	98	++	++	Not restrained	122	138	Good	1	1,000	
10	G. C. S.	84	20	98.6	+	+	Not restrained	104	118	Good	1	1,000	
11	J. G.	115	22	98.8	+++	+++	Restrained	160	120	Good	1	2,000	
12	W. L. J.	90	22	98.8	.....	+++	Not restrained	192	165	Good	2	1,000	+
13	E. O.	118	24	99	++	+++	Not restrained	170	160	Good	2	1,000	
14	C. M.	116	20	98.2	+	+++	Not restrained	140	130	Good	3	1,000	
15	M. S.	90	20	98.8	+++	+++	Not restrained	115	120	Good	1½	900	
16	G. J.	90	20	98.8	+++	+++	Restrained	178	138	Good	2½	1,000	
17	D. McP.	90	22	101	+++	+++	Restrained	125	130	Poor	7	1,000	+
18	H. C.	94	20	98.8	++	+++	Not restrained	210	200	Good	1½	1,000	
19	J. O. C.	100	22	98.6	+++	+++	Not restrained	170	145	Good	6½	2,000	
20	F. W.	94	20	98.6	+++	+++	Not restrained	158	150	Good	2	1,000	
21	D. B.	82	22	98	+++	+++	Not restrained	122	104	Good	2	1,000	
22	J. O. L.	88	22	100.6	+++	+++	Restrained	118	146	Good	4½	1,000	
23	L. C.	88	18	98.8	++	+++	Not restrained	126	120	Good	2	1,000	+
24	H. P.	72	20	98.8	++	++	Not restrained	100	132	Good	1½	1,000	
25	E. A.	90	22	100	+++	+++	Restrained	95	122	Good	4	1,000	
26	J. C.	96	20	98.8	+	+++	Not restrained	104	122	Good	2½	1,000	
27	J. A.	82	20	98.6	+++	+++	Restrained	142	120	Good	5	1,000	
28	T. G.	90	18	101	+++	+++	Restrained	142	130	Good	2	1,000	
29	J. A.	82	20	98	.....	+++	Not restrained	98	132	Good	3	1,000	
30	T. H.	84	28	98.8	++	+++	Not restrained	148	150	Good	1	2,000	
31	M. J. H.	90	20	98.6	++	+++	Not restrained	146	145	Good	3	1,000	
32	H. B.	120	24	101.4	+++	+++	Restrained	140	138	Poor	6	1,000	+
33	J. J. C.	108	22	98.4	++	++	Not restrained	120	100	Good	1	1,000	+
34	H. D.	80	18	98	+++	+++	Restrained	120	125	Fair	2	1,000	+
35	C. D.	100	24	98.4	+++	+++	Restrained	142	124	Good	4	1,000	+
36	J. D.	92	20	98.6	+++	+++	Restrained	132	118	Fair	4½	1,000	+
37	J. F.	84	22	99.6	+++	+++	Restrained	146	100	Good	6½	1,000	+
38	J. K.	80	24	99	+++	+++	Restrained	148	120	Good	4½	1,000	+
39	J. M.	80	20	98.4	+++	+++	Restrained	198	175	Good	4½	1,000	+
40	W. J. M.	96	18	98.8	++	+++	Not restrained	118	102	Good	2½	1,000	+
41	H. B.	90	18	98.8	+++	+++	Restrained	130	130	Good	3	1,000	+
42	H. F.	90	20	98.8	.....	++	Not restrained	148	135	Good	1½	900	
43	R. D.	100	22	98.6	.....	++	Not restrained	....	....	Good	½	1,000	
44	W. H. C.	90	20	98	+	+	Not restrained	....	....	Good	1	1,000	
45	J. W.	78	22	101.2	++	++	Not restrained	....	....	Good	2	1,000	
46	A. C. J.	106	20	100	+	++	Not restrained	....	....	Good	2	1,000	
47	N. D.	100	20	100	+++	+++	Restrained	....	....	Good	2	2,000	
48	B. F. W.	96	20	98.6	+	+++	Not restrained	....	....	Good	2	1,000	
49	E. W.	90	20	98.4	+++	+++	Not restrained	....	....	Good	3	1,000	
50	E. A. W.	84	20	98.4	+++	+++	Not restrained	....	....	Good	3	1,000	
51	G. P.	84	22	98.6	+	+++	Not restrained	....	....	Good	2	1,000	
52	F. H.	90	20	99	+++	+++	Restrained	160	148	Fair	3	1,000	+
53	H. C.	88	20	99	+++	+++	Not restrained	220	180	Good	3	1,000	+
54	E. O.	90	21	98.6	.....	++	Not restrained	150	140	Good	1	1,000	
55	B. H.	80	20	98	.....	++	Not restrained	140	130	Good	1	1,000	
56	B. A. H.	82	22	99	.....	++	Not restrained	150	128	Good	1	1,000	
57	E. Y.	80	20	98.6	.....	++	Not restrained	140	130	Good	1	1,000	
58	J. C.	82	20	98.6	+++	++	Not restrained	150	130	Fair	3	1,000	
59	M. C.	90	22	100	+++	+++	Restrained	....	....	Died	4 hr.	2,000	
60	C. A.	90	22	101	+++	+++	Restrained	200	180	Died	20 hr.	1,000	
61	J. J.	120	28	99.8	+++	+++	Restrained	106	106	Died	8	1,000	
62	A. P.	100	22	100	+++	+++	Restrained	138	140	Died*	.....	1,000	
63	F. H.	82	24	98.6	+++	+++	Restrained	104	122	Poor	8	1,000	+
64	J. N.	84	22	99.2	+++	+++	Restrained	130	140	Poor	1	1,000	
65	F. M.	120	36	104.4	+++	+++	Restrained	150	118	Poor	10	1,000	

* Septic infection.

Mortality, 9.3 per cent. Average time of detention, 2.63 days. Average blood pressure, 140.

and he was removed to the San Francisco Hospital Jan. 24, 1916, where he died.

Postmortem: The coroner's physician reported death due to lobar pneumonia.

CASE 64.—J. N. was brought to the Central Emergency Hospital Dec. 28, 1915, at 8:20 a. m., with a diagnosis of acute alcoholism.

He was wildly delirious, talking incoherently, and seeing objects about the room. The blood pressure was 130.

Treatment: At 5:25 p. m. he was given intravenously 1,000 c.c. of the bromid mixture. This was followed by a severe chill. He became quiet, but was very weak. He died at 7:50 p. m., was taken to a private undertaker, and we were unable to get a postmortem.

Up to this time our solutions were prepared with distilled water that was bought by the hospital in five-gallon jugs. We changed and made them up with tap water, filtered through a Berkefeld filter, and sterilized under pressure. Since adopting the latter method the chills have not occurred. It is better to use freshly distilled water if it can be obtained, but distilled water that is not fresh should not be used; it is better to use tap water.

In the preparation of the solutions 5.8 gm. of chemically pure sodium chlorid and 8.4 gm. of chemically pure sodium bicarbonate are boiled in 120 c.c. of distilled water and filtered through paper, then placed in a flask and reboiled. In addition 10.2 gm. of chemically pure sodium bromid is boiled in 30 c.c. distilled water, filtered and reboiled. These may be kept ready for use, and when needed are added to 850 c.c. of either freshly distilled water or tap water that has been filtered and boiled. Under no circumstances should old distilled water be used, as I have found that it produces severe chills. This mixture is heated to about 110 F. and is ready for use.

The glucose used in the early cases was the anhydrous variety, but on account of the price and our inability to procure it in sufficient quantity, I found that I could prepare the glucose crystals found in the market and that the results were satisfactory. In a flask with 250 c.c. distilled water 80 gm. are placed and boiled. To this is added 0.25 gm. of blood charcoal. This is allowed to stand for twenty-four hours, is then filtered into a clean flask, reboiled, and is ready for use. This solution may be made up and kept ready for use.

Both of these solutions must be given very slowly, from twenty to thirty minutes being taken for the 1,250 c.c.

A small percolator, such as is used in giving salvarsan, with rubber tubing and needle attached, is all the apparatus that is needed.

The after-treatment followed in these cases consisted of active elimination, produced by 0.3 gm. calomel followed by 30 gm. magnesium sulphate. The diet had to conform to the general hospital routine and consisted of milk, soup and bread. In private practice I feed my patients sugar in large quantities and furnish alkali to keep down acid intoxication.

I had had no previous experience in handling these acute deliriums, and my conclusions are based on the testimony of the attendants at the Emergency Hospital. They are agreed that the mortality is lower, the time of detention less, the period of delirium much shortened. The patients eat better, they can be trusted to take care of their excretions on account of a much clearer mental condition, and the desire for alcohol is abolished, at least for the time being.

The mortality in this series of sixty-four cases was 9.3 per cent., the average time of detention 2.63 days. I am unable to compare these results with the previous work at the Emergency Hospital. In my series I treated only the very acute cases, and the previous histories do not differentiate this type of patient from the type that simply drinks too heavily.

I am presenting this paper in a preliminary way in the hope that it may stimulate someone engaged in this line of work to compare its results with those obtained by the present methods of treating these cases.

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ABSTRACT OF DISCUSSION

DR. MARTIN H. FISCHER, Cincinnati: Dr. Hogan has invited me to see some of his patients, and I confess that I have been tremendously impressed by the ease with which he controls them. I had opportunity to see something of the difficulties ordinarily attendant on such cases when I was in charge of an institution to which a good many delirium cases were brought. It seems most logical and effective to regard them as brain edemas and then to try to reduce these edemas with an alkaline, hypertonic salt solution carrying the bromid, while at the same time the attempt is made to overcome the starvation acidosis, which is so often heaped on the acidosis incident to the alcoholic poisoning itself. I feel confident that Dr. Hogan has made a distinct advance in our methods of handling this very unfortunate group of patients.

DR. S. A. MATTHEWS, Lawrence, Kan.: The essayist spoke of the hypertonicity of the salt solution used. He could increase the hypertonicity a good deal and still be within safe limits. I have perfused patients with solutions containing 5 gm. of sodium chlorid, 80 gm. of sodium sulphate, 15 gm. of sodium citrate, and half a gram of calcium chlorid to the liter, perfusing as much as 2 liters in five hours (about 5 c.c. per minute) with perfect safety. At least the patients are still living after fifteen years and enjoying good health. The sugar is not necessary to produce the required dehydration. I suppose the object of the sugar is to supply a source of energy to the body. Of course, the contained salts in the solution should tend toward the maintenance of an alkaline reaction, which may be accomplished either by carbohydrates or citrates.

DR. JAMES J. HOGAN, Vallejo, Calif.: I agree that you can use hypertonic solutions in great quantity in these cases, but that depends entirely on the salt which is used. Speaking about the urinary secretion following the different molecular concentrations of the different salts, we found that the dehydrating effect of the salt was dependent on its component ions. In this work the solution used had no effect outside of a slight crenating effect on the red blood corpuscles. It is impossible in a short paper to bring out all the data in relation to this work, but we used a solution that produced no ill effects on the blood as far as we could see. If you put any hypertonic solution into the blood, you always produce a shrinkage of the red cells, as well as a shrinking of the other solid colloids of the body.

DR. J. P. MUNROE, Charlotte, N. C.: How much sugar is used in these cases?

DR. HOGAN: Eighty gm. of dextrose were used in 250 c.c. of sterile tap water. Although my paper simply covered the treatment with the combination of salts which I have described, I previously had worked with most of the protein dehydrators, as sodium sulphate, magnesium sulphate and calcium chlorid, and with calcium chlorid itself, with sodium chlorid, and sodium carbonate mixtures and with dextrose in varying concentrations. In furnishing the dextrose to an individual of this type you not only furnish an available carbohydrate, but with every increase in concentration of the dextrose in the perfusion mixtures, you get a corresponding dehydrating effect on the protein colloids of the body. This is especially so in relation to the swellings of the central nervous system. In reference to the determination of the acid intoxication in these cases, the work so far has only covered a complete urinary examination. Further work is being done in relation to CO_2 tension of the alveolar air, and the hydrogen ion concentration of the blood serum.

AN EXPERIMENTAL RESEARCH INTO THE NATURE OF NITROUS OXID AND OF ETHER ANESTHESIA

WITH SPECIAL REFERENCE TO CERTAIN EFFECTS ON THE ORGANS OF THE BODY, AND CERTAIN RELATIONS TO NORMAL SLEEP, HYDROGEN-ION CONCENTRATION AND INFECTIONS *

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If we view man and the lower animals as adaptive mechanisms, governed by the universal laws of physics and chemistry, then we must believe that every phase of human or animal behavior is occasioned by and in turn occasions physical and chemical changes in the body. Therefore an understanding of the vast alterations in the behavior of the anesthetized organism—changes which may range from the slightest depression of mental power through progressively deeper stages of unconsciousness to death, necessitates a search for the physical and chemical changes caused by the anesthetic. Accordingly, in this study we shall consider (*a*) the gross behavior of the anesthetized individual in a consideration of the relation of anesthesia to normal sleep; (*b*) the influence of ether and of nitrous oxid on the histologic structure of certain organs; (*c*) the relation of ether and of nitrous oxid to the hydrogen-ion concentration of the blood and to reserve alkalinity; (*d*) the relation of ether and of nitrous oxid to the infections, and finally, (*e*) the clinical bearing of these studies.

(*a*) *The Relation of Inhalation Anesthesia to Normal Sleep.*—The outward similarity in the appearance of sleep and of anesthesia needs no comment. The manner in which a child becomes unconscious under a sufficiently concentrated flow of nitrous oxid over its face closely resembles the manner in which the healthy normal child falls asleep. That sleep is merely the depression of consciousness and that sleep only partially suspends the function of the brain is indicated by slight responses to stimuli, such as the shifting of posture; the moving when called or when bright light strikes the eye; the response to tickling, etc. In other words, the receptors are still active during sleep. The activity of the receptors in anesthesia is evidenced as clearly by the increased pulse and respiration in response to trauma; and, if the anesthesia be light, by increased muscular tone, even by muscular movements. Another similarity is found in the resemblance between dreams during nitrous oxid anesthesia and the dreams of normal sleep.

(*b*) *The Influence of Ether and of Nitrous Oxid on the Histologic Structure of Various Organs.*—As far as nitrous oxid is concerned, here also is found another resemblance to normal sleep. During normal sleep the histologic changes in the brain, the suprarenals and the liver caused by exertion, emotion, infection, acid injection, etc., are repaired; during nitrous oxid anesthesia also, the lesions in the brain cells due to these causes are repaired, and, as will be seen later, nitrous oxid exerts a measurably protective action on the suprarenals and liver as well. This protective action of nitrous oxid was strikingly demonstrated in a series of experiments on insomnia. A group of rabbits were kept awake continuously for approximately 100 hours. At the end of this period, their brain cells showed the typical physical changes of exhaustion. In another group these changes were partially restored after a single séance of sleep; while in still another group, in which the rabbits were allowed no normal sleep, but were placed under nitrous oxid anesthesia for one hour out of every six during a period of approximately 100 hours, the brain cells, as in the rabbits allowed to sleep, showed marked restoration, some cells, indeed, being in a *plus normal state.*

A comparative study of the effects of ether and of nitrous oxid was made by keeping dogs under continuous anesthesia for four hours. After four hours' continuous ether anesthesia, striking histologic changes were found in the brain, the suprarenals and the liver; while after four hours' continuous nitrous oxid anesthesia, there were practically no changes in the brain, and but slight changes in the liver and suprarenals.

(*c*) *The Relation of Ether and of Nitrous Oxid to the Hydrogen-ion Concentration of the Blood and to Reserve Alkalinity.*—In a series of H-ion concentration tests made for me by Dr. M. L. Menten, it was found that the H-ion concentration of the blood was increased by ether and by nitrous oxid, and that the acidity increased more rapidly under nitrous oxid than under ether; but that the total acidity in either case was proportional to the depth of anesthesia.

In measurements of the reserve alkalinity of the blood made for me by Dr. W. B. Rogers, he found that during anesthesia the reserve alkalinity gradually decreased, the total decrease being greater under ether than under nitrous oxid. He found also that the alkalinity of the spinal fluid and of the bile was altered during anesthesia.

It is significant to note here the fact that the histologic lesions in the brain, the suprarenals and the liver, caused by ether and by nitrous oxid, though varying in degree, are identical in kind with those caused by the intravenous injection of acids, as with those resulting from insomnia, exertion, emotion, infection or physical injury.

We must conclude, therefore, that the histologic lesions of inhalation anesthesia are acid lesions; and since acid lesions are restored only during sleep, that the same must be true of the lesions of anesthesia.

As long as fifteen years ago, it was believed that all anesthetics interfered with the use of oxygen, this being the method by which anesthesia was produced. It is true that deep asphyxia may cause anesthesia, but in such asphyxia as is due to obstruction of the larynx, the patient remains conscious and feels pain, though he is markedly cyanotic, while under good inhalation anesthesia, the patient is pink and unconscious. It would seem, therefore, that interference with oxidation alone is an insufficient explanation of anesthesia. On the other hand, the postulate that anesthesia is an induced acidity is not only supported by the laboratory studies we have mentioned, but by the clinical phenomena of anesthesia as well.

It may be in place to refer here to Lillie's notable studies of the mechanism of ether anesthesia. He has demonstrated that the addition of ether to the seawater in which arenicola are living causes changes in the semipermeable membranes, as a result of which these membranes become less permeable to the passage of ions. As life itself is dependent on the permeability of the cells of the organism to the passage of ions, this action of ether suggests a further explanation of anes-

* Read before the American Association of Anesthetists, Detroit, June 12, 1916.

thesia, though its application has not been worked out in detail.

(*d*) *The Relation of Ether and of Nitrous Oxid to the Infections.*—We have already referred to the protective action of nitrous oxid in the presence of the stimuli of continued consciousness as in prolonged insomnia; and other histologic studies have shown that morphin also protects the brain, suprarenals and liver from the destructive action of prolonged or intense stimuli. It follows, then, that since the effects of an infection on the brain, suprarenals and liver are identical with the effects of insomnia, emotion, etc., then the administration of nitrous oxid and morphin will in part protect the organism against the damaging effect of infection.

Summary of Experimental Findings: Nitrous oxid and ether anesthesia alike cause an increase in the H-ion concentration of the blood, the spinal fluid and the bile; and progressively decrease the reserve alkalinity of the blood. Ether causes marked histologic changes in the brain, suprarenals and liver, these changes being identical in kind with the histologic lesions caused by acid injection, or activation of any kind. Nitrous oxid and morphin each measurably protect the brain against histologic changes due to infection, while ether increases the damaging effects of infection.

(*e*) *The Clinical Bearing of These Studies.*—The identity of the phenomena of anesthesia with the succession of clinical symptoms which accompanies an increasing acidosis, combined with the fact that the histologic changes produced by nitrous oxid and by ether are identical with those caused by acidosis, supports the postulate that anesthesia is an induced acidity. If the acidity is slight, anesthesia is light and the patient responds to even slight stimulation. As the acidity increases, the anesthesia deepens—first, associative memory is lost, but the cutting of the skin still causes involuntary movements; then muscular tone is lost, and even the strong contact stimuli of a surgical operation cannot drive their impulses through the brain to the muscles; and finally, the decreasing alkalinity may so nearly approach the neutral point that even the circulatory and respiratory centers, which are especially adapted to respond to the stimulus of increased H-ion concentration, fail to respond; respiration and circulation are suspended and acid death—anesthetic death—follows.

These studies explain why a patient, whose reserve alkalinity has been seriously reduced by exertion, emotion, physical injury or infection, or, by reason of starvation, interference with respiration or impairment of the liver or kidneys, is approaching acidosis, does not take an inhalation anesthetic well; why there is much nausea and slow recovery from anesthesia in some cases and death in others, and why, in particular, children who are near acidosis always pass into that state and die unexpectedly.

These facts show how necessary it is for the surgeon and the anesthetist alike to realize that during the operation each is draining the store of reserve alkalinity. If the surgeon employs a local anesthetic, uses gentle manipulation and produces the least possible trauma, he conserves his patient and demands from the anesthetist less of the damaging inhalation anesthetic. The anesthetist in turn conserves the patient by using the lightest possible even anesthesia administered with the least psychic trauma.

These studies show that for the bad risk patient, nitrous oxid anesthesia is to be preferred to ether, and that analgesia with local anesthesia should be employed, with general anesthesia only when it is demanded by certain phases of the operation.

These researches suggest the value of a mechanistic view of the phenomena of anesthesia and attach a high importance to the work of the anesthetist.

In my own clinic we have now administered nitrous oxid anesthesia in over 15,000 cases without a death; and moreover, as our knowledge and experience accumulate, we are able with increasing accuracy to adapt the anesthetic to the individual.

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CONSTITUTIONAL INFERIORITY*

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In presenting the conception of constitutional inferiority it is necessary to emphasize the fact that the human mind is complex and intricate in structure, as well as from the point of view of organic and social heredity and its adaptation to the environment. It is important to bear in mind that in early life mental adjustment is purely instinctive and emotional. Furthermore, the volitional and intellectual faculties with the moral sense make their appearance rather late in mental development. While it is true that the whole mental organism is of a sensitive nature, nevertheless it evinces considerable plasticity necessary for adaptation. It is also to be remembered that because of these sensitive and plastic qualities, this organism is capable of receiving environmental impressions of favorable or pernicious character.

Of great significance is the fact that there is an underlying organic basis for the harmonious union of psychic forces necessary for the execution of a coordinate mental act, that is a healthy equilibrium of emotion, volition and intellection, which are controlled by organic heredity, and only in part modified by social evolution. It is not difficult to conceive how a congenital defect[1] in the affective, or volitional, or intellectual sphere or in all spheres may produce psychic instability, and indeed to such an extent as to cause a maladjustment of varying degree and intensity. The fact that an isolated enfeeblement of the intellectual faculty only is not at all requisite to characterize constitutional inferiority per se is quite apparent. It is interesting to note that a lesion of one faculty may indirectly disturb the function of the entire mental organism.

In classifying constitutional inferiority, it is advisable to be guided by the individual fundamental disorder involved in each of the three faculties. Upon this basis we may divide mental inferiority into three large groups, intellectual, emotional, and volitional.

The intellectual type embraces a wide range of inferiority, which may differ in character and quality. Idiocy, imbecility, and moronism are examples of one extreme. Again, there are forms of relative intellec-

* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Karpas: Psychic Inferiority, New York Med. Jour., 1913, xcvii, 594.

tual deficiency which in a large number of instances are not of social evil, because volitional and emotional faculties are not so impaired as to bring about antisocial upsets.

The emotional form of mental inferiority presents well-defined characteristics. In some instances there is a deficiency or excess of emotional activity of such a nature as to produce distinct types of personalities. The *mental clams* are a well-known class. They are seclusive and secretive, rather timid and self-absorbed, indulge in dreams and the real world is of very little source of interest to them. Some of them are oversensitive, suspicious, and chronic masturbators. Such a type of personality was termed by Hoch as "shut-in" and is found in a large number of cases of dementia praecox. However, some of them never develop a psychosis or a neurosis, but they exhibit some difficulty to adjust themselves to their environment.

On the other hand, there is another type of personality which is of a highly vivacious nature, and of vacillating mood. Such persons are loquacious, rather keen, and manifest lack of capability to suppress or repress their feelings. This form of mental make-up is met in manic-depressive insanity, which was also described by Hoch.

In addition to these two striking types there is another one in which emotional instability is the fundamental disorder. To this class belong the nervous and hysterical temperament and a hypochondriacal and neurasthenoid disposition. To be sure, such individuals evince considerable instability and some of them develop definite neuroses or psychoses. Particularly it is true of the nervous temperament, which in addition to syphilis or alcohol develops psychoses peculiar to these etiologic factors.

Another important type of an abnormal personality which is determined by perverted feeling is known as the psychopath, or, in popular language, the crank. I prefer to call it a congenital psychoneurosis, because it has so many earmarks of an actual neurosis, though it is not amenable to radical treatment. Such persons present definite psychopathic characteristics which express themselves in oddity of conduct, vagaries in dress, asocial tendencies and fantastic ideas. As a class they are unstable and are not wage earners. They appear intellectual, but their education is only smattering and superficial. They are failures in life; the Utopian fancies in which they indulge never or rarely take a constructive or practical course. As a rule they do not commit gross crimes, except some sexual offenses, which they justify on the ground of the moral code peculiar to their kind. They make themselves conspicuous, but they are tolerated in society to some extent because they seldom come in collision with the law except in extreme instances in which their sociologic beliefs are at variance with the existing statutes.

Of all the other forms of constitutional inferiority none is as significant as the volitional type, because of its great social import. The underlying disorder is lack of development of will-power, feeling and moral sense. And to quote Maudsley:[2]

> He has no capacity of true moral feeling; all his impulses and desires, to which he yields without check, are egoistic; his conduct appears to be governed by immoral motives, which are cherished and obeyed without any evident desire to resist. There is an amazing moral insensibility.

There are no apparent intellectual disturbances according to the usual gross tests. However, on more searching analysis, one finds considerable superficiality, apperceptive faculty is weak, the enfeebled judgment is quite manifest when confronted with difficult situations or tasks and the stock of knowledge takes an egoistic trend. In the words of Maudsley:[2]

> The intelligence is often acute enough, being not affected otherwise than in being tainted by the morbid feelings under the influence of which the persons think and act; indeed they often display an extraordinary ingenuity in explaining, excusing, or justifying their behavior, exaggerating this, ignoring that, and so coloring the whole as to make themselves appear the victims of misrepresentation and persecution. Their mental resources seem to be greater sometimes than when they were well, and they reason most acutely, apparently because all their intellectual faculties are applied to justification and gratification of their selfish desires. One cannot truly say, however, that the intellect is quite clear and sound in any of these cases, while in some it is manifestly weak.

In formation of habit and character, volition, emotion and the moral sense play a very important part, and this explains why in these individuals the habits are faulty and the character is altered. They are deceitful, given to lying, contrive numerous schemes to cheat and have no control of their primary impulses, such as the sexual and nutritional instinct. A marked autoerotic feeling is in the foreground, which may assume different phases and forms. The altruistic tendency is very superficial, or not developed at all. In the attempt to adjust themselves they follow the path of least resistance, and because devoid of moral sense and deficient in will-power and feeling, they commit all kinds of antisocial deeds, which are frequently determined by temptation, suggestion and environment. However, the last invariably shows a certain degree of inconsistency between the act and the actual stimulus.

Were we in possession of concrete tests to gage such an abnormal mental state, we should have little difficulty in demonstrating that the emotions and volition are of a distinctively primitive type; in other words, we are dealing with a psychic malformation in which only one part of the mental organism reached a degree of maturity.

The clinical varieties of the volitional form of constitutional inferiority are many and indeed in some instances they remain undetected till they come in conflict with the law. It is significant to note that the more atrocious the crime, the more difficult to convince the layman or even the physician that such a crime resulted from an abnormal mind.

It cannot be too strongly emphasized that antisocial tendencies which are recurrent in nature and which are not adequately modified by environmental influences are invariably determined by a psychopathic condition. In this connection the question of mental responsibility may be introduced. Do such persons have a full knowledge of the nature and quality of the crime they have committed? If an intact mentality is determined by one faculty only, intelligence, and the other two, emotion and will-power, are to be disregarded, then such a sophistic conception of mental responsibility may appear plausible. However, according to modern psychology an intact mentality must depend on the harmonious balance of the three faculties, emotion, volition and intelligence; then how can a moral defective be truly responsible for a crime, when in reality he is constitutionally incapable of differentiating between right and wrong? The sooner we get away from the old conception of mental responsibility, the sooner we will come to a better under-

2. Maudsley: Responsibility in Mental Diseases, p. 184.

standing of the underlying factors controlling such abnormal mental state. The persistent inability on the part of the individual to conform with the moral law is sufficient proof that the inherent defect lies not in the environment but in the mental constitution.

In a broad sense, the volitional form of constitutional inferiority should be regarded as a psychosis, because there is a marked element of maladjustment present. It is a malignant form of mental aberration and does not yield readily to rectification.

This is not a new disease, but it was recognized by the English physician Prichard[3] as early as 1835, when psychiatric progress was at the low ebb, anatomic knowledge of the nervous system was deficient, and psychologic investigations were permeated by the atmosphere of crude philosophic dogmatism. Prichard termed this peculiar mental affection moral insanity. Later investigators, while differing in the nosologic conception, yet admit the occurrence of such an abnormal mental state. Some preferred to term it moral imbecility, moral idiocy, and constitutional inferiority. It is of little practical interest what such a pathologic mental condition may be designated, the fact remains that this malignant form of mental aberration is of relatively frequent occurrence and is a great social evil. A large majority of the criminal class, tramps, vagrants, prostitutes, chronic alcoholics and other degenerates, belong to this group.

The following case is of interest:

A. is 12 years of age, born in England, and comes apparently from a healthy family. He was brought to the mental hygiene clinic because for the past eighteen months he has been continually stealing.

There are no neuroses, psychoses or mental degeneracy in the family or its collateral branches.

The patient is the second of five children. Labor was instrumental because of the child's large head, which was relatively out of proportion to the rest of his body. There is no history of convulsions or fainting attacks, but he suffered from enuresis for many years. He sustained several injuries to the head in early childhood. At the age of 7 he had membranous croup and at 7½ years of age suffered with chorea. He had measles, but no meningitis.

He entered kindergarten at 3 and later attended school; he failed only once in promotion, but this was ascribed to poor deportment.

The mother thinks that following the attack of croup he began to show changes in his mental condition, when he became restless, fidgety and stubborn. However, he is said to be good natured, but at times appears revengeful. Otherwise he is bright intellectually. He plays with boys and has many friends. He reads books and spends his evenings at home.

For the past eighteen months he has been given to stealing from his family and strangers. He takes everything he can turn into money. He gets up at night and steals money from his parents or from a stranger who happens to stay in the house. In addition, he lies a great deal and has absolutely no control over himself, although he realizes that it is wrong to take things which do not belong to him. Once he was arrested, but because he showed good intellectual endowment the mother was advised not to commit him to a reformatory.

Mentally the patient makes a fairly good impression. He appears bright and according to the intellectual tests is not feebleminded in the true sense of the word. When questioned about his acts he shows very little embarrassment. He admits that it is wrong to steal, but he could not help it, in his words: "I cannot resist the temptation, I want to get things." He knows that for stealing he will get a prison sentence. Despite the fact that he was reading very diligently of the recent trial and that he was told by his mother that he is just like the accused, nevertheless he makes no attempt to control himself. He states that with the money he steals he buys candy and spends it in other frivolous manner.

From the physical point of view, except for a large head he shows no other abnormalities and there are no neurologic signs.

With this brief outline of the fundamental conceptions of constitutional inferiority, we may now briefly consider the question of the care and treatment of such patients. It is needless to state that the most important thing is to detect those forms of mental abnormalities in the early development stages, when simple adjustment may be undertaken. The normal mind is elastic and finds little difficulty to adapt itself to certain surroundings, whereas the abnormal requires an artificial environment in the process of adaptation. It is interesting to recall Huxley's[4] conception of education. In his own words: "What is meant by education is learning the rules of this mighty game. In other words, education is the instruction of the mind (intellect[5]) in the laws of nature, under which name I include not merely things and their forces, but men and their ways." He compares the world to a chessboard, the pieces to the phenomena of the universe, and the rules of the game he calls the laws of nature. The successful player is the one who knows the chessboard well, and has a good knowledge of the laws of nature. It may not be far fetched to say that the integrity of mental health depends on the knowledge of the laws of nature and ability to utilize them correctly in the adjustment of one's environment, the chessboard. If the chessboard is too complicated for one to play his game, why encourage him to make these mistakes repeatedly to his own detriment and to the detriment of society? In such cases give him a simple chessboard to play an uncomplicated game which does not overtax his mentality.

Briefly stated, prophylaxis in the plastic stage is the important measure, and special pedagogic methods, religious and moral influence, environmental reconstruction and physical and manual training are necessary in the process of readjustment and reeducation in such cases.

For the fully developed cases of the first and second group the actual care and treatment present less of a problem than the last class, inasmuch as many of them can be cared for in institutions for the insane or the feebleminded.

The volitional form of mental inferiority exerts directly and indirectly a pernicious influence on society. The fully developed cases with definite antisocial tendencies are incarcerated in protectories, prisons, reformatories, etc., but this in itself does not solve the problem in so far as such treatment is only symptomatic and not radical. Persistent and recurrent attacks of antisocial upsets should not be ascribed to sociologic conditions, but deeper strata for such abnormal reaction should be sought in one's mentality. It is manifestly important to analyze crime from three angles: First, we should obtain a complete knowledge of the psychologic background from which such a crime emanated, and ascertain the individual from the point of view of heredity and constitutional make-up. Second, we should determine the character and nature of the committed act and the frequency of its recurrence. Third, we should ascertain whether such a crime was

3. Prichard: Treatise on Insanity, London, 1835, p. 12.

4. Huxley: Liberal Education, p. 83.

5. Intellect is used by Huxley; mind is substituted by the writer because it expresses the entire structure and function of the mental organism. In education the emotional and volitional spheres are just as important as the intellect.

determined by environmental motives. In many instances the antisocial deed gives the first clue of the person's defective mentality and indeed this is very important to establish in order to save society from such detrimental influences. Just the same as the homicidal paranoiac is a dangerous member of the community, so is the moral defective, and should be treated in a similar manner. They are both malevolent, and society should be protected against them. A deeper appreciation of this abnormal type of mentality will necessarily create ways and means of establishing institutions for such individuals and at the same time change our old conceptions of mental responsibility, and control further progress of vice, crime, and other forms of degeneracy.

ABSTRACT OF DISCUSSION

DR. F. P. NORBURY, Springfield, Ill.: I would like to add a few remarks from the medicolegal point of view, when we are confronted with this type of constitutional inferiors in the so-called malingerers. As Dr. Karpas has said, these are the individuals who, when confronted with a difficult situation, seek the easiest way out and that within their own limitation. Malingering simply is a way out oftentimes. This not only occurs in civil cases, but I have been concerned with three cases of murder wherein malingering was attempted to be carried out as a possible defense for connection with the crime, the insanity, however, being assumed after commission of the crime. We proved the understanding of responsibility on the part of the defendant as outlined by criminal law. When that legal test was applied these individuals were convicted as murderers and a life sentence was imposed in two cases. The third case is still pending, and the fourth case is one that reached our supreme court on some technical errors in the trial. The man was sentenced for life but on account of the errors the case came to the Supreme Court of Illinois for review and retrial based on a technicality involving this very point of malingering. However, I do not know whether the case will ever come to trial, because when brought back the defendant made his escape and so far has not been apprehended. But he is constitutionally inferior in the emotional, the volitional, and the intellectual aspects of life. In one case that I had under observation, a man being tried for forgery in the United States Court assumed insanity as his defense. He truly was a malingerer. We all know that the malingerer as we see him, no matter whether involved in a criminal procedure or some milder offense, or even when attempting to deceive in some other way, is of an inferior type. This to him is the way out of a difficult situation and offers also an opportunity for him to make his impress on others to help him out of some situation, as for instance, begging alms or through interest in others affairs.

DR. M. J. KARPAS, New York: Most cases of constitutional inferiority of the volitional type do not malinger, as a rule. When they are under restraint they are perfectly willing to tell their whole life history and, indeed, this is rather characteristic in this group of cases. I must confess that I have not yet encountered a malingerer in this class of cases in the true sense of the word.

Salt in the Diet.—Mungo Park, the traveler, describes his own feelings on long-continued salt want as follows: "I found the scarcity of salt actually painful. The continued subsistence on nothing but vegetable food produced finally a desire for salt so painful that it can hardly be described." We are not familiar with any prolonged experiments with salt-free diets on man. But persons on ordinary diets who have gone for a long time without sodium chlorid complain in general of lack of appetite (owing to the unpalatability of the food), and of some vague or general bodily distress—a condition similar to that induced by monotonous and incomplete diets.—A. J. Carlson, Control of Hunger in Health and Disease.

A NEW TREATMENT FOR PARALYSIS AGITANS *

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An Italian author[1] states that in paralysis agitans "no treatment is of any avail," and "there is no authentic case of recovery." A severely distressing malady, of acknowledged incurable nature, and until now of absolutely untreatable form, deserves a few minutes' consideration when even only slight and temporary relief from suffering has been brought to the patient.

The clinical details of the case that determine the diagnosis run as follows:

History.—(M. R.—P. H. No. 3040).—Woman, aged 52, married, German, housewife, first came to the Psychopathic Hospital, June 29, 1915, complaining that the hands trembled, the feet dragged, and the body felt constantly heavy. The trouble began in 1909, when her left arm commenced to tremble. This continued from July to October, and then disappeared. February 2 it began again, and had gradually increased since. The left arm had also grown gradually weaker and stiffer, and its use now amounted to very little. The right arm began to tremble about the same time as the left, but she could use it more. For a year the lower extremities had also showed tremor, and the left one was stiff. Use of the right arm gave an intense shoulder pain. There was much pain in the muscles of the left arm. The tremor ceased with effort, was absent at night, and was worse in excitement. Work was much interrupted by the slowness of the patient's movements, and general stiffness. She was restless and trembled in bed for half an hour before she was able to get to sleep. This all amounted to severe, constant suffering.

The patient had had measles. Menstruation began at 19; hysterectomy had been performed for suspected tumor at 42. This was followed by "pleurisy" and "nervous prostration" Three years after the operation a sponge was removed from the upper abdomen.

The patient's mother died of cholera in 1866 and her father at 62 of pleurisy. Four children were well.

Examintion.—This in general was negative. Below the left breast was the scar of the sponge removal, below the umbilicus the scar of the laparotomy. There was clonic rotation of hands. There were varicose veins on the legs. The tongue extended with tremor. The arm reflexes and patellar jerks were active. The gait was bear-like. The left leg was somewhat spastic; this was more noticeable when walking fast. Oscillations were about four to the second. There was very marked tremor in speech.

A diagnosis of paralysis agitans was made.

Treatment and Results.—The patient was assigned some treatment for the marked tremor in her speech. I was inspired to try *something*, because of the marked improvement obtained in a previous speech case of so-called "essential tremor," in which the patient had been treated for two years without improvement at another hospital. I gave some vowels to be sounded in a prolonged steady fashion, with no intention of attacking the general condition.

To make a long story short, the patient soon returned to relate that the tremor in the hands was a little better; and she felt better. I took the hint, and applied slow motions to the arms and legs to be executed for fifteen minutes, three times a day. The tremor, stiffness and distress gradually grew less. In about two weeks she had an hour of complete relief from all her symptoms—tremor, stiffness, tiredness, pain in arms and heaviness. She could soon go to sleep at once on retiring without tossing about as before for half an

* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Rizzuto: Policlinico, Rome, Nov. 21, 1915; abstr., THE JOURNAL A. M. A., Jan. 22, 1916, p. 316.

hour. Later, she had two hours of complete relief again as above, and at another time went from 7 to 11 o'clock one evening entirely free from symptoms. She was not seen by me at these times, but I have no reason to doubt her words or minimize her claim. She has become so devoted to the exercises that she now takes them merely for the relief they bring. Since February the scales have turned. At that time she had sciatica, and ceased exercising, while confined in bed. With this all the symptoms returned and were as severe as they were before. When seen, June 5, 1916, she had begun to return to her routine again with returning relief.

Let me give the motions in detail:

CONTROL EXERCISES FOR PARALYSIS AGITANS

Patient stands with all clothing constrictions removed. All motions should be executed slowly. The speed is about 3 feet in ten seconds. All sudden, quick or reflex-like motions should be omitted. Each exercise is repeated three times. The patient should practice from fifteen to thirty minutes, three times a day. Exercises:

1. Right arm up to side. Down (shoulder level).
2. Right arm up front. Down.
3. Right arm up back. Down.
4. Right arm flex. Extend.
5. Right hand open. Shut.
6-10. Same for left arm.
11-15. Same for both arms together.
16. Right leg up to side. Down.
17. Right leg up front. Down.
18. Right leg up. Back. Down.
19. Right leg flex. Extend.
20. Toes extend. Flex.
21-25. Same for left leg.

The form of the exercise may be varied from those given, but the important point is the *slowness*.

One case proves little. I should be glad to hear the results from any who try these exercises. A series of cases are now under treatment to be reported later. I find no treatment like this in the books on paralysis agitans.

In one case, at least, the marked temporary relief from severe suffering has amply repaid for all the trouble to do the exercises.

SUMMARY

A marked case of paralysis agitans was treated with slow moving exercises taken for fifteen minutes three times a day, and resulted in (1) a general constant relief of bad feelings, (2) occasionally an hour of complete relief from all distressing symptoms, and (3) a quickly gained repose into sleep on retiring.

The treatment, though giving marked relief from intense suffering even to the point of recovering normal conditions for hours at a time, proves no cure, and the symptoms all returned when the exercises were omitted; but they showed improvement again when resumed, and also again gave relief.

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Symbolism and Fact.—Too often symbolism and tradition govern us in our daily affairs, and especially in the consideration of these vital problems of age, growth and death. We conceive time to be a lean, repulsive old man with an hour-glass and scythe, mowing down the human race. Death is also personified and looked on as a "grim reaper" by pathologists as well as poets. Now, time is a mere mathematical abstraction, a synthesis of space and motion. It can no more kill a man than can the Rule of Three. Man is not chased to the grave by an absurd old man with a scythe and an hour-glass, but by myriads of microscopic enemies, by streptococci, largely, and spirochetes and pneumococci, and others of that ilk.—Eugene L. Fisk.

CLONORCHIS SINENSIS IN ORIENTALS ARRIVING IN THE UNITED STATES

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Very little attention seems to have been paid to this parasite during the last few years in this country, and very few references to it can be found in our literature. In 1890 Biggs reported a case found postmortem in New York. In 1895 Johnson reported several cases in Montreal. In 1906 Mark Johnson White of the United States Public Health Service reported eighteen cases in Chinese found postmortem during the plague investigations in San Francisco in 1901 and 1902.

Surgeon-General Blue[1] mentions *Clonorchis sinensis* as one of the parasites that should be looked for and guarded against.

Craig[2] draws attention to the disease caused by this parasite, and states that over twenty cases have been reported in the United States.

The present article is based on the examination of 686 Chinese and thirty-two Japanese; 507 of the Chinese were examined on arrival on the Pacific Mail Steamship Company's line at San Francisco, and the results relate only to the incidence of the infection, as no physical examination or later observations were possible. All of these, while en route, had been treated for hookworm disease with thymol.

In this series of 507 examinations, 105, or over 20 per cent., were found to harbor the *Clonorchis sinensis*. The accompanying table shows the number of passengers examined and found infected on each steamer. None of them on casual inspection showed evidence of serious physical maladies. Anemia and general debility, possibly the result of the hookworm disease and the treatment they had just undergone for it, were all that was observed.

RESULT OF EXAMINATION

Steamer No.	Passengers Examined	Number Infected	Percentage Infected
1	102	19	18
2	82	7	8
3	45	21	46
4	85	24	28
5	61	18	29
6	142	16	11

In this connection it should be stated that all of these people had been examined prior to embarkation in the Orient, and none had been allowed to embark who showed evidence of any serious malady.

Of ninety-seven additional persons examined after arrival, some having been treated for hookworm and some not, twenty, or over 20 per cent., were found infected. Thus, out of 604 Chinese arriving at San Francisco, 125, or practically 20 per cent., were found to harbor the *Clonorchis sinensis*.

The examination of eighty-two sick Chinese, residents of California, showed twenty-four, or over 29 per cent., to harbor the infection. The longest any of these persons had been in the United States without a visit to China was eight years. Several had been in this country continuously for from four to six years.

An examination of thirty-two sick Japanese, residents of California, showed four infected, a percentage of 12. All of these had been in the United States

1. Blue, Rupert: Prevention of Oriental Diseases, address before the American Academy of Medicine, 1915.
2. Craig: Am. Jour. Trop. Med., July, 1915.

but a short time. Thirteen of the twenty-eight persons showed no symptoms that could be directly attributed to the clonorchis infection. Three had enlarged livers and three enlarged spleens. Ten had tenderness over the liver, spleen or upper abdomen, and several were subject to attacks of pain in these regions, sometimes with vomiting. One had ascites and edema of the feet. Fleeting pains in the muscles and joints were frequently complained of. A pasty complexion was usually observed, though the hemoglobin was not very greatly reduced — ranging in the series from 62 to 92 per cent. The eosinophil count averaged 5 per cent. The stools showed almost constantly a reaction for occult blood.

In general the patients were decidedly below par, most of them having to discontinue work occasionally on account of their symptoms.

No necropsies have been obtained by me. White, of the Public Health Service, in the necropsies done by him, states that the parasites were confined to the biliary passages, gallbladder and intestines in numbers varying from two to 800. Only a few were found in the duodenum and gallbladder, and but shreds of dead ones in the colon. None were found in other organs. There were found mucosal thickening and moderate fusiform dilatation of the bile passages. The liver substance adjacent to ducts was firm and showed many small hemorrhages apparently due to obstructed capillaries.

Sambuc, in Indo-China, has reported two cases in which the parasites were found at necropsy in the pancreatic ducts.

It is stated that ova of this parasite have been found in the abdominal lymphatics and in the abscesses not adjacent to the biliary passages.

As to the frequency with which the disease is found in the Orient, Mathis demonstrated it, in the Tonkin district, in 5 per cent. of those examined.

Cadbury, in an examination of seventy-six students from Canton, found it in over 10 per cent. It is stated[3] that in some districts 17 per cent. of the population are affected.

In Japan, according to Katsumada, there are districts in which over 50 per cent. of the inhabitants are infected.

In Japan the clonorchis has been found in dogs, cats and hogs as well as in human beings.

In China Leiper found it in the dog, but was unable to demonstrate the intermediate host, which in Japan has been shown to be a fish. It is believed by some that the fish is the second intermediate host, the first being unknown.

There seems to be a great difference of opinion as to the pathogenicity of this parasite, some believing that it usually causes no symptoms, while others claim that serious symptoms are frequently produced.

Manson says:

> This parasite, which for long was supposed to be practically innocuous, is now held to be the cause of a serious disease of the liver, which may terminate fatally. Indeed, there can be no doubt of this when one considers that in some of the cases recorded several thousand parasites were present.

Castellani and Chalmers say:

> There is an abnormal appetite, but the general health remains good for some time, though the liver enlarges and becomes painful, while jaundice may be present. The spleen also enlarges. The disease is apparently very chronic, but toward the end emaciation, ascites, edema about the feet and legs, and diarrhea lead to death from exhaustion.

White expressed the opinion that the importation of this fluke into the United States is a distinct menace to the public health.

In view of the fact that this disease is incurable, and that if once implanted in this country it would be practically impossible to eradicate it completely, it would seem to be the part of wisdom to prevent its wholesale importation, at least until such time as it has been reasonably demonstrated that we have not a suitable fish or other animal capable of acting as an intermediate host.

Experimenting with cats, without an intermediate host, I have been unable to transmit the disease through the skin or by feeding. Naturally these results would be expected in view of our present knowledge of the transmission of other digenetic trematodes where it has been so clearly shown recently by Leiper in the case of *Schistosoma japonica* and bilharzia that the infection can take place only after the development in the intermediate host of the cercaria, which may enter the final host directly through the skin.

In the diagnosis of clonorchis infections, the very small size of the egg makes it quite possible for it to be overlooked. Furthermore, in light infections but very few eggs may be found in the stool.

3. Maxwell and Jeffery: Diseases of China.

THE COMPOSITION AND PHYSIOLOGIC ACTIVITY OF THE PINEAL GLAND*

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Within the last few years the pineal gland has attracted some attention as a result of experiments conducted by Dana and Berkeley,[1] and McCord.[2] They fed this gland to young animals such as dogs, guinea-pigs, chicks, rabbits, cats, etc., and found that it caused them to outgrow the control animals, both in size and in sexual maturity. The addition of even small amounts of desiccated gland to the food is stated to be sufficient to produce marked results. It has also been found that infant glands are more active and give better results than adult glands. The present investigation was carried out for the purpose of determining the constituents and physiologic activity of this gland and to ascertain if any difference exists in glands from different species and between glands from young and from mature animals. Cattle, sheep and lambs, which usually furnish the raw material for pineal preparations in this country, were selected for this purpose. Approximately 900 glands from full-grown cattle were collected during March, 1915. During December, 1915, and January, 1916, 1,458 glands from cattle, 1,348 glands from sheep and 5,062 glands from lambs were obtained.

The glands were removed from the brains immediately after the heads were opened, and carefully trimmed, which in this case is a very easy matter, as the glands have but little connective tissue attachment

* From the Research Laboratory in Organotherapeutics, Armour & Co.

1. Dana, C. L., and Berkeley, W. N.: Med. Rec., New York, May 10, 1913, p. 835; Berkeley, W. N.: Ibid., March 21, 1914, p. 513.
2. McCord, C. P.: The Pineal Gland in Relation to Somatic, Sexual and Mental Development, The Journal A. M. A., July 18, 1914, p. 232; id., ibid., Aug. 7, 1915, p. 517.

and are free from adherent fat. The cattle glands are long and fusiform, often with black spots, while the sheep and lamb glands are short and plump and more uniformly light colored. The glands were weighed and stored at freezing temperature until the entire lot had been collected. The various lots were minced finely and desiccated in vacuo at a temperature between 35 and 37 C. After drying to constant weight, the glands were coarsely ground and extracted with petroleum benzin in a Soxhlet apparatus. The weight of the fresh glands, together with the loss of moisture and petroleum ether-soluble substance, will be found in the accompanying tabulation. On the desiccated fat-free material, moisture, ash, phosphoric acid and total nitrogen were determined.

When these figures are compared it will be noticed that cattle glands are relatively small and that sheep and lambs contain much more pineal tissue per unit of bodyweight than cattle. The ash and phosphorus in the infant glands are somewhat less and the total nitrogen slightly higher than in adult glands. Practically no difference exists in the phosphorus content of cattle glands from two successive years, while there is considerable variation in the ash content. There is no obvious relation between phosphorus and total ash. Pineal glands from lambs contain less phosphorus than sheep glands, and these, in turn, less than cattle glands. All the samples were tested for epinephrin and iodin with negative results.

WEIGHT OF GLANDS OF CATTLE, SHEEP AND LAMBS, WITH LOSS OF MOISTURE AND PETROLEUM ETHER-SOLUBLE SUBSTANCE

	Fresh Glands						Desiccated Fat-Free Material							
	Total Number of Glands	Average Weight of Glands	Maximum Weight of Glands	Minimum Weight of Glands	Moisture in Fresh Tissue	Petroleum Ether-Soluble	Yield of Desiccated Fat-Free Material	Moisture	Ash	Phosphorus Pentoxid (P_2O_5)	Total Nitrogen	Protein (Nitrogen × 6.25)	Ash (Dry Basis)	Phosphorus Pentoxid (P_2O_5) (Dry Basis)	Total Nitrogen (Dry Basis)	Protein (Dry Basis)
	-	Gm.	Gm.	Gm	%	%	%	%	%	%	%	%	%	%	%	%
Pineal glands from cattle, collected March, 1915	886	0.21	0.60	0.10	83.9	2.2	13.9	2.75	7.35	2.76	12.72	79.50	7.63	2.91	13.22	82.63
Pineal glands from cattle, collected December, 1915, and January, 1916	1,458	0.18	0.35	0.0	81.6	2.8	15.6	5.10	8.10	2.75	12.68	78.94	8.53	2.95	13.31	83.19
Pineal glands from sheep, collected December, 1915, and January, 1916	1,348	0.12	0.25	0.0	82.7	2.5	14.8	5.65	8.20	2.44	12.68	79.25	8.69	2.65	13.44	84.00
Pineal glands from lambs, collected December, 1915, and January, 1916	5,062	0.08	0.18	0.0	83.5	2.5	14.0	6.25	7.05	2.16	12.83	80.19	7.52	2.37	13.69	85.56

The petroleum ether-soluble portions of the various lots of glands, after evaporation of the solvent, were of a transparent amber color and of waxy consistency, resembling crude lipoids from brain tissue both in odor and appearance. A sample from full grown cattle glands contained 5.7 per cent. phosphorus, calculated as pentoxid, equivalent to 64.1 per cent. of lecithin.

The physiologic action of pineal extract on unstriped muscle was determined, in this investigation, by the isolated uterus method generally employed in the standardization work of pituitary liquid made from the posterior lobe of the pituitary body. Ten per cent. solutions of the various lots of fresh glands and the equivalent of the desiccated glands were made both with neutral and slightly acidulated isotonic salt solution. The finely hashed or powdered glands were macerated with the solvents, boiled for ten minutes and filtered. Various amount of the different liquids were diluted with Locke's solution and their contracting power compared with a 1:20,000,000 dilution of betaimidazolylethylamin hydrochlorid. All the pineal liquids tested possessed slight contracting power on the uterus of the virgin guinea-pig. These contractions were, however, even smaller than those caused by anterior lobe extract of similar strength and consequently insignificant in comparison with those produced by an equal amount of the posterior lobe of the pituitary body. No material difference could be detected between the extracts made from infant glands and those from adult glands. In this connection it should be remembered that solutions made from ordinary brain tissue possess some uterine contracting power.

The ductless glands of medicinal merit, such as the thyroid, the suprarenals and the pituitary body, all show distinct physiologic actions on the system which can readily be observed, measured and recorded. If the pineal gland possesses therapeutic value, it would be natural to expect such activity, in some form or other; but in contrast to the important results reported on the feeding of even minute quantities of this organ stand out the insignificant results obtained by actual physiologic testing of the gland. Much of the published work along these lines refers to the action of the pineal gland on the blood pressure. Eyster and Jordan[3] found that aqueous extracts of the pineal body, on intravenous injection, produced a slight fall of mean arterial blood pressure and a moderate and transitory diuresis, but no change in the pulse. On the excised heart the pineal had no important effect. Ott and Scott[4] arrived at the same conclusions, and further noticed that pineal extract increased the contractile power in the pregnant uterus and the intestinal wall to a slight degree. On the other hand, Dixon and Halliburton,[5] as well as Dana and Berkeley,[1] all reported negative blood pressure experiments, by the use of pineal extract made with various solvents. When these reports are averaged, it becomes very evident that the action of pineal extract on the blood pressure is quite insignificant.

If the problem is observed from the opposite direction, namely, the systemic changes caused by extirpation of the glands, the results are equally negative.

3. Eyster, J. A. E., and Jordan, H. E.: Proc. Am. Jour. Physiol., 1910-1911, xxiii, 28.
4. Ott, I., and Scott, J. C.: Month. Cycl. and Med. Bull. (Philadelphia), 1912, v, 207.
5. Dixon and Halliburton: Quart. Jour. Exper. Physiol., 1909.

Dandy[6] states that following the removal of the pineal, no sexual precocity or indolence, no adiposity or emaciation, no somatic or mental precocity or retardation were observed. The experiments yielded nothing to sustain the view that the pineal gland has an active endocrine function of importance during either infancy or adult life. The pineal is apparently not essential to life, and seems to have no influence on the well-being of the animal.

CONCLUSIONS

Comparisons have been made between pineal glands from cattle, sheep and lambs. It was found that beef glands are relatively small and that both sheep and lambs contain much more pineal tissue per unit of body weight than do cattle. Infant glands contain less phosphorus and more total nitrogen than adult glands.

Pineal glands from both species show only slight contracting power on unstriped muscle. This is very much less than that produced by equal amounts of the posterior lobe of the pituitary body, and not sufficient to be of physiologic significance.

Since the actions of pineal glands, both on the blood pressure, the pulse rate and the excised heart, as well as on the uterine and intestinal muscle, are insignificant in therapeutic doses, and since health is not influenced by extirpation of the gland, it becomes difficult, at least with our present knowledge of physiologic chemistry, to accept or even consider the pineal body as an internal secretory organ of medicinal value.

THE SALICYLATES

III. SALICYLATE ALBUMINURIA *

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AND
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There is no uniform agreement as to the appearance of albumin in urine, following the administration of salicylate in rheumatic and normal individuals. Its presence is claimed by some,[1] and doubted or denied by others.[2] Because of the confusion in the mode of application of tests for albumin, the origin of the albuminuria, that is, whether febrile or renal, has also remained unsettled. The object of the present contribution is to settle definitely whether or not salicylates can cause albuminuria, and if it is of febrile origin.

The excretion of albumin was studied qualitatively (heat and ferrocyanid tests), and quantitatively (gravimetric method of Folin and Denis[3]), together with phenolsulphonephthalein excretion in some and the nonprotein nitrogen of the blood in the majority, of sixteen patients. Nine of these suffered with rheumatic fever, and seven were nonrheumatic and practically normal. Sodium salicylate was administered in doses of 2 gm. every hour, in the form of solution until signs of "toxicity," that is, ringing in the ears, deafness, dizziness and nausea appeared, when the administration was stopped. The fluid intake was maintained constant, usually 80 c.c. of water, together with 20 c.c. of the salicylate solution, being administered every hour until "toxicity," and then 200 c.c. of water every two hours until the experiment terminated, which usually required from three to four days. Urine was collected in ten-hour periods until salicyl free. At the same time the usual clinical observations on pulse, blood pressure, respiration and temperature were also carefully recorded. With the exception of the temperature, which was reduced in the rheumatic individuals, there were no important changes demonstrable in these functions, and, therefore, they may be considered of no importance in connection with the problem here under consideration. Table 1 contains various pertinent data from the clinical histories of all the individuals.

SALICYLATE CAUSES ALBUMINURIA

Turning now to the urinary changes, it was found that salicylate causes prompt albuminuria, together with the appearance of leukocytes and bodies resembling small granular casts, in both rheumatic and nonrheumatic individuals. When the urine, before the administration of salicyl, was free from these elements, they disappeared at the end of the experiment (third to fourth day), that is, on the completion of salicyl excretion. On the other hand, if the urine showed the presence of these elements before salicyl, they tended to persist, though markedly diminished, after salicyl excretion was completed.

The presence of small, oblong and round granular bodies suggested the presence of casts. In ordinary clinical examinations, such bodies would undoubtedly be considered as casts. However, the presence of easily discernible nuclei in the granular masses suggests leukocytic disintegration, occurring in hypotonic urines such as these generally happened to be. Moreover, in dogs during the administration of salicyl, in doses corresponding to those used in human individuals, the freshly obtained urines always showed the presence, chiefly, of well preserved leukocytes, and also red blood corpuscles. It may be doubted, therefore, whether these bodies are casts in the ordinary sense, particularly if it is remembered that casts are somewhat later manifestations, whereas here acute conditions (a matter of a few hours) are concerned.

The maximum excretion of albumin took place at the end of about ten hours after administration, that is, approximately at "toxicity." Chart 1 illustrates the quantitative excretion of albumin by the different individuals, and shows that the course for both rheumatic and nonrheumatic individuals is the same. Chart 2 (diuresis) illustrates that excretion of albumin takes place independently of the water output. The urine output at "toxicity" is considerably diminished, and hence the concentration of albumin is markedly increased.

ALBUMINURIA IS NOT OF FEBRILE ORIGIN

The results of previous observers leave open the possibility that the albuminuria might be of febrile origin rather than due to the salicylate. The results of

6. Dandy, W. E.: Jour. Exper. Surg., 1915, xxii, 237.

* From the Medical Clinic of City Hospital and the Pharmacological Laboratory, Western Reserve University.

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Owen: Brit. Med. Jour., 1881, ii, 1081. Ackeren: Charité-ann., 1890, xv, 253. Lüthje: Deutsch. Arch. f. klin. Med., 1902, lxxiv, 163. Kleinberger and Oxenius: Ibid., 1904, lxxx, 225. Frey: München. med. Wchnschr., 1905, lii, 1326. Glaesgen: Ibid., 1911, lviii, 1125. Chistoni and Lapresa: Arch. di farmacol., 1909, viii, 63. Rocco: Ibid., 1913, xiii, 567. Quensiaedt: Therap. d. Gegenw., 1905, xlvi, 97.

2. Knecht: München. med. Wchnschr., 1904, li, 956. Brugsch: Therap. d. Gegenw., 1904, xlv, 58. Mamlock: Med. Klin., 1905, i, 523; i, 53. Wiley: U. S. Dept. Ag. Bur. Chem. Bull., 84, Part II, 1906. Ehrmann: München. med. Wchnschr., 1907, liv, 2595. Hanzlik, P. J.: A Study of the Toxicity of the Salicylates Based on Clinical Statistics, THE JOURNAL A. M. A., March 20, 1913, p. 957.

3. Folin and Denis: Jour. Biol. Chem., 1914, xviii, 273.

the observations here reported settle this point definitely on the side of the salicylate, simply because of the fact that albumin, leukocytes and castlike bodies promptly appear in the urines of afebrile and nonrheumatic individuals. The sequence of events, that is, appearance of the albumin, maximum excretion and its course and abatement took place in practically the same way.

In animals (dogs and cats) which gave no evidences of albuminuria previous to the injection of salicylate, a prompt appearance of albumin and leukocytes and red blood corpuscles in the urine followed the injection of salicylate. No quantitative estimations were made; but, judging from qualitative tests, the course of the albuminuria was about the same as in human individuals.

EFFECT ON RENAL FUNCTION

The severity of the reaction (albuminuria, etc.), together with a marked depression in urine excretion, might be referred to some interference with renal function. To aid in the elucidation of this, the phenolsulphonephthalein excretion, and nonprotein nitrogen of the blood at different periods during an experiment, that is, before salicyl, at "toxicity," twelve hours after "toxicity," and at the end of the experiment, were studied.

Nonprotein Nitrogen.—Table 2 presents the results that were obtained. These show practically no important differences between the different periods. In some cases (particularly nonrheumatics) there appears to be a slight accumulation of nonprotein nitrogen, in others (particularly rheumatics) a slight diminution at "toxicity," when the albuminuria is most pronounced. The results which we have accumulated with animals are too few and uncertain to merit consideration. It may be mentioned that one animal (Cat 4), which had received three "toxic" doses of salicylate within forty-five hours, showed a marked accumulation of nonprotein nitrogen (from 22 to 130 mg.) in the blood at the end of this time. This animal also showed the most marked cloudy swelling of the kidney. The results which we have obtained with human material are somewhat similar to those of Denis, who found that when the nonprotein nitrogen of the blood was about normal, salicylate produced practically no effect on this fraction. However, when it was abnormally high, a considerable diminution took place after the administration of the drug.

Phenolsulphonephthalein Excretion. — This remained about the same throughout all periods in three (6, 7 and 8) nonrheumatic individuals; somewhat decreased in two (14 and 15), and somewhat increased in two (13 and 16) at "toxicity," as compared with the period before salicyl was administered. On the whole, the effects cannot be interpreted as a diminution of renal functional efficiency.

Water Excretion.—All individuals (both rheumatic and nonrheumatic) showed a diminution in water excretion at "toxicity" (Chart 2). This can be explained to a large extent as due to the marked sweating which took place particularly in the rheumatic patients.

TABLE 1.—CLINICAL DATA*

Number and Patient	Diagnosis	Condition of Temperature	Fluid Intake	Toxic Dose of Salicyl,† Gm.	Diaphoresis	Urine Output at "Toxicity" or Shortly After	Urinary Changes: Albumin, Before Salicyl	Albumin, During Salicyl Medication	White Blood Corpuscles, Before Salicyl	White Blood Corpuscles, During Salicyl Medication	Granular Casts or Castlike Bodies, Before Salicyl	Granular Casts or Castlike Bodies, During Salicyl Medication
Nonrheumatic												
6 (F. D.)	Appendicitis	Afebrile	180 c.c. every hr. for 7 hrs.	12.04	Mild	Lessened	+ tr.	+ inc.	+ oc.	+ inc.	‡—	+
7 (L. E.)	T. B. kidney(?) Tabes dorsalis	Afebrile	300 c.c. every 2 hrs. thereafter 150 c.c. every hr. for 8 hrs.	13.76	Marked	Lessened	+ tr.	+ inc.	+ oc.	+ inc.	—	+
8 (H. M.)	Normal	Afebrile	300 c.c. every 2 hrs. thereafter 150 c.c. every hr. for 9 hrs.	15.48	Mild	Lessened	—	+	+ oc.	+ inc.	—	+
9 (A. P.)	Normal	Afebrile	400 c.c. every 2 hrs. thereafter 100 c.c. every hr. for 12 hrs.	14.96	Very mild	Lessened	—	+	—	+	—	+
10 (J. B.)	Normal	Afebrile	200 c.c. every 2 hrs. thereafter 100 c.c. every hr. for 11 hrs.	19.30	.....	Lessened	+ tr.	+ inc.	—	+	—	+
13 (D. T.)§	Normal	Afebrile	200 c.c. every 2 hrs. thereafter 100 c.c. every hr. for 7 hrs.	13.31	Mild	Lessened	+ tr.	+ inc.	—	+	—	—
14 (J. T.)§	Normal	Afebrile	200 c.c. every 2 hrs. thereafter 100 c.c. every hr. for 6 hrs.	10.5	Mild	Lessened	+ tr.	+ inc.	+ oc.	+ inc.	—	—
15 (M. Z.)§	Normal	Febrile	100 c.c. every hr. for 6 hrs.	10.5	Marked	Unchanged	+ st.	+ inc.	+	+ inc.	+	+
16 (M. C.)§	Normal	Afebrile	100 c.c. every hr. for 6 hrs. 200 c.c. every 2 hrs. thereafter	12.3	Mild	Markedly diminished	+ tr.	+ inc.	+ oc.	+ inc.	+ oc.	+ inc.
Rheumatic												
1 (P. F.)§	R. F.	Febrile	256 c.c. every hr. for 12 hrs. 256 c.c. every 2 hrs. thereafter	13.41	Moderate	Lessened	—	+				
2 (J. M.)	R. F.	Febrile	170 c.c. every hr. for 8 hrs. 300 c.c. every 2 hrs. thereafter	12.81	Profuse	Lessened	—	+	—	+	—	+
3 (W. C.)	R. F.	Febrile	100 c.c. every hr. for 9 hrs. 200 c.c. every 2 hrs. thereafter	15.48	Profuse	Lessened	+ tr.	+ inc.	+ oc.	+ inc.	+ oc.	+ inc.
4 (J. H.)§	R. F.	Febrile	220 c.c. every hr. for 8 hrs. 440 c.c. every 2 hrs. thereafter	14.45	Profuse	Lessened	+	+ inc.	—	+	—	+
5 (J. L.)§	R. F.	Febrile	200 c.c. every hr. for 8 hrs. 400 c.c. every 2 hrs. thereafter	14.45	Very profuse	Lessened	+ tr.	+ inc.	+ oc.	+ inc.	—	+ oc.
11 (S. V.)	R. F.	Febrile	160 c.c. every hr. first 11 hrs. 200 c.c. every 2 hrs. thereafter	18.53	Moderate	Lessened	+ tr.	+ inc.	+ oc.	+ inc.	+	+ inc.
12 (W. B.)	R. F. Old T. B. lesion of apex	..... Febrile	100 c.c. every hr. for 5 hrs. 200 c.c. every 2 hrs. thereafter	8.75	Very profuse	Lessened	+ tr.	+ inc.	—	+	—	+

* In this table the various signs and abbreviations have meanings as follows: R. F. = rheumatic fever; plus (+) sign, present; minus (—) sign, absent; tr., trace; inc., increased; oc., occasional; st., strong.
† Salicyl was administered in form of sodium salicylate, expressed as salicylic acid.
‡ The albuminuria in this individual was not studied quantitatively. In such cases, the urines were either utilized for other quantitative studies, or they had stood too long to give trustworthy results for albumin.
§ Also sodium bicarbonate, 14 gm.

Histologic Examination of the Kidney.—The kidneys of four animals (three dogs and one cat) which had received salicylate, and showed marked albuminuria, leukocytes and erythrocytes in the urine, were examined by Professor Karsner of the pathologic laboratory. His description and interpretation of these, and brief protocols of the experiments, are as follows:

EXPERIMENT 1.—Dog, 3.1 kg. Urine before salicyl was albumin free; received 0.3 gm. sodium salicylate per kilogram by mouth; one hour later there was marked albuminuria. On the following day there was still marked albuminuria; received two doses of 0.3 gm. each per kilogram, but vomited almost immediately after each dose; 4 gm. of salicylate were then injected in three divided doses hypodermically within thirty minutes; animal was killed one and one-fourth hours after last dose. Albuminuria was severe; red and white cells were present in the urine.

Glomeruli show slight congestion but otherwise normal tufts; occasional glomeruli show albuminous precipitate in the subcapsular space. Epithelium of the proximal convoluted tubules shows moderate cloudy swelling; the lumina of these tubules show much granular albuminous precipitate. Other parts of the tubule are normal. There are no casts.

Diagnosis.—Cloudy swelling of kidney.

EXPERIMENT 2.—Dog, 5.4 kg. Urine before salicyl contained a trace of albumin, which was markedly increased together with the appearance of white and red cells after the subcutaneous injection of 0.9 gm. sodium salicylate. Two days later the animal received 3.3 gm. salicylate in two divided doses; the animal died during the night; urine from bladder gave strong albumin tests and showed the presence of white and red corpuscles.

Picture somewhat obscured by postmortem degeneration. Glomerular tufts normal save for slight congestion; the subcapsular spaces contain much granular precipitate and also a moderate number of desquamated capsular epithelial cells; the latter, however, are probably the result of postmortem change. The epithelium of the convoluted tubules shows marked granularity, and the lumina contain many albuminous granules. There are no casts. Other tubules show less marked granular change. Around some of the large blood vessels there is an old connective tissue growth.

Diagnosis.—Postmortem degeneration and probably cloudy swelling of kidney.

EXPERIMENT 3.—Dog, 5.6 Kg. For four days previous to injection of salicylate, urine showed a trace of albumin. On day of experiment, urine was albumin free. Received single injection of 0.05 gm. salicylate per kilogram hypodermically; seven hours later urine gave strong albumin tests and showed presence of white and red corpuscles; dog found dead in cage next morning; 5 c.c. of urine were obtained from the bladder, and this gave very strong albumin tests, and showed numerous white corpuscles and granular castlike bodies. Blood before salicyl contained 52 mg. nonprotein nitrogen in 100 c.c.; seven hours after injection of salicyl, and when albuminuria was pronounced, 62.3 mg. in 100 c.c.

Postmortem degeneration has advanced to such a degree as to render description useless.

EXPERIMENT 4.—Cat, 3.2 kg. Urine before salicyl showed questionable trace of albumin for two days; 1.05 gm. sodium salicylate were injected in three divided doses in the course of forty-five hours; 700 c.c. water were administered at different times, and about 300 c.c. urine were voided during this interval. Animal was killed. Urine at all times gave marked albumin tests and showed many white and a few red blood corpuscles. Before the administration of salicyl the blood contained 22.4 mg. nonprotein nitrogen in 100 c.c.; just before the animal was killed, the blood contained 130 mg. in 100 c.c.

The glomeruli show practically normal vascular tufts; the subcapsular space in many instances shows a moderate amount of albuminous precipitate; a small number of glomeruli show swelling of the capsular epithelium. The epithelium of the proximal convoluted tubules shows well marked granularity of the protoplasm, in some instances hyalin, droplet formation, and the tubular lumina contain much granular albuminous precipitate and not infrequently many desquamated epithelial cells. The tubules otherwise are normal; there are no casts.

Diagnosis.—Cloudy swelling of kidney. The change might be called by some authors an acute tubular nephritis, but without more marked tubular change, and especially in the absence of notable change in the glomeruli tuft, such a diagnosis seems hardly justifiable.

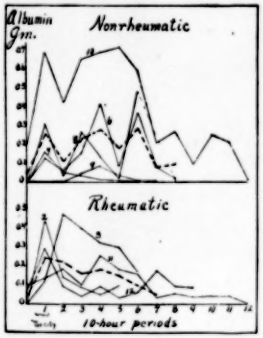

Chart 1.—Effect of salicylate on excretion of albumin in urine of rheumatic and nonrheumatic individuals. In this and the following chart, the numbers refer to the individuals; the broken lines represent averages.

Summarizing the various evidences of the effects of salicylate on renal function, it can be said that so far as the phenolsulphonephthalein excretion and nonprotein nitrogen of the blood are concerned, no marked deficiency in the functional efficiency of the kidney has been demonstrated. The diminution in water excretion can be explained by the diaphoresis. Morphologically, there also does not appear to be any clear cut evidence of nephritis. However, Ackeren[4]

4. Ackeren: Charité-ann., 1890, xv, 253.

TABLE 2.—NONPROTEIN NITROGEN OF THE BLOOD AND PHENOLSULPHONEPHTHALEIN EXCRETION IN THE URINE OF RHEUMATIC AND NONRHEUMATIC INDIVIDUALS RECEIVING FULL THERAPEUTIC DOSES OF SALICYLATE

Period	Nonrheumatic Individuals																		Rheumatic Individuals							
	6		7		8		9		10		13		14		15		16		5		11		12		12†	
	N. P. N.*	Phthalein*	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	Phthalein	N. P. N.	
Before salicyl	42.6	60	30.6	55	27.5	70	33.3	..	24.0	..	52.2	62	52.2	70	53.1	74	25		33.1	..	21.1	..	40.6	..	66.3	
At "toxicity"	49.6	55	44.6	60	35.5	60	48.2	..	14.2	..	42.5	75	52.5	50	63.2	25	35		24.0	..	24.1	..	29.4	..	63.1	
12 hrs. after "toxicity"	54.6	60	41.6	55	27.5	65	49.2	..	16.5	..	....	....	....	....	....	....	..	..	26.9	..	21.3	..	14.1	..		
End of experiment	76.6	60	16.6	60	10.2	70	39.3	..	19.5	..	....	....	....	....	....	....	..	..	29.4	..	24.3					

* The N. P. N. (nonprotein nitrogen of blood) represents mg. in 100 c.c. of blood. The method of Folin and Denis (Jour. Biol. Chem., 1912, xi, 527) was used with 5 c.c. of blood, 10 c.c. of filtrate, and distillation (using hundredth normal acid and alkali) instead of the colorimetric procedure. The phenolsulphonephthalein excretion was carried out in the usual way, the figures representing percentage of excretion in two hours.

† Used 2½ months previously; convalescing; required 9.0 gm. salicylate for "toxicity."

claims to have produced hemorrhagic nephritis in rabbits with salicylic acid. Vinci [5] reports a toxic parenchymatous nephritis in an individual (45 years of age) who died thirty-one hours after the ingestion of 35 gm. of sodium salicylate. Pronounced renal lesions in experimental animals due to salicyl are also reported by Vinci.

In this connection, it is interesting to note that Denis [6] has demonstrated a reduction of the uric acid content of the blood following the administration of salicylate in full therapeutic doses, the nonprotein nitrogen of the blood at the same time remaining unchanged or reduced. These effects were interpreted as due to an increase in renal permeability. It has been observed previously by many investigators [7] that salicylates cause an increase of uric acid excretion in the urine, and the causes for this have been variously stated, but in no case was the uric acid content of the blood studied. Benzoic acid, which is chemically related to salicylic acid (ortho-oxybenzoic acid), has been found by Denis [8] to decrease the uric acid content of the blood and simultaneously increase the excretion in urine. On the other hand, para-oxybenzoic acid, which is therapeutically inert in rheumatic fever, did not affect the uric acid content of the blood and urine. Cinnamic and quinic acids also had practically no effect on the uric acid of the blood and urine.

The excretion of albumin and the presence, chiefly, of leukocytes, and in animals, of leukocytes and erythrocytes, could conceivably be due to an increase in renal vascular permeability. In this connection, it might be recalled that certain clinicians [9] claim to have successfully used salicylate for the absorption of fluid from pleural cavities (increased permeability of serous membranes), and Oswald [10] claims that salicylate increases the permeability of colloids for electrolytes, and it has previously been demonstrated by one of us (P. J. H.[11]) that salicylate markedly increases the permeability of excised intestine for iodid. Taking all of these evidences together, it would seem that salicylate is capable of increasing the permeability of organs for diffusible substances. Whether the increased permeability to albumin and cells is an analogous phenomenon is a disputable question.

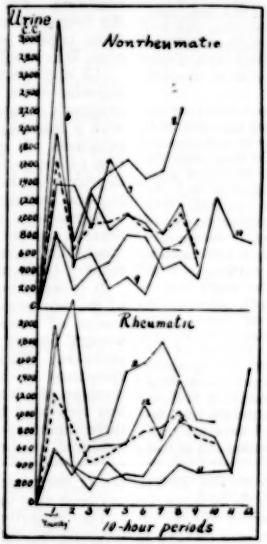

Chart 2.—Effect of salicylate on diuresis in rheumatic and nonrheumatic individuals.

CONCLUSIONS

1. Following the administration of full therapeutic doses of sodium salicylate, the urines of both rheumatic and nonrheumatic (normal) individuals showed the presence of albumin, leukocytes and bodies resembling small granular casts.

2. Quantitatively, the albuminuria reaches its maximum at "toxicity" (ringing and deafness in ears, vomiting, etc.); then gradually diminishes and eventually disappears, a trace of albumin persisting in those individuals who showed a trace of albumin before the administration of the salicylate.

3. The phenolsulphonephthalein excretion and nonprotein nitrogen of the blood at different periods during an experiment, that is, before salicyl, at "toxicity," twelve hours after "toxicity," and at the end of the experiment (third to fourth day) show no decisive differences.

4. The water excretion at "toxicity" is diminished, and this can be explained by the marked sweating which occurs particularly in rheumatic individuals.

5. The albuminuria is not of febrile origin because it is promptly produced in the afebrile organism; the sequence of events, that is, appearance of albumin, maximum excretion, its course and abatement, taking place precisely the same way.

6. Observations on animals with doses of salicylate corresponding to those used in human individuals led to the demonstration of prompt and severe albuminuria, together with white and red blood corpuscles in the urine.

7. Morphologically, the kidney shows distinct cloudy swelling, affecting particularly the proximal convoluted tubules, associated with the appearance of granular albuminous precipitate in the subcapsular space of the malpighian body.[12]

We wish to express our thanks to Prof. E. P. Carter for permission to use the clinical material of the Medical Clinic at City Hospital; to Prof. Howard T. Karsner for examination and interpretation of the kidney material; to Dr. F. C. Tyng, resident physician, and all those at City Hospital who have contributed their services in numerous ways in this and other salicyl investigations.

ABSTRACT OF DISCUSSION

DR. TORALD SOLLMANN, Cleveland: The series of Dr. Hanzlik settles the dispute of the occurrence of albuminuria after the administration of the salicylates. With this series of experiments there is no doubt that the doses of salicylates used therapeutically do produce albuminuria. Whether that has any significance or not is yet to be decided and will require further work. Of course, the occurrence of albumin should make one cautious with the administration of the salicylates where renal changes are known to exist. It does not appear that permanent damage is done with the doses ordinarily employed. As far as is known these patients do recover perfectly, the albumin disappears and leaves no change behind. The question depends on the causation of this albuminuria. Is this albuminuria due to inflammatory changes in the kidneys, or to the increased permeability. This is a question still further to be investigated. Dr. Hanzlik reports variable results as to nitrogen retention and the phenolphthalein test which might be due to two factors—a nephritic change which tends toward retention, and an increased permeability which tends toward increased excretion. The two things may exist at the same time so that in

5. Vinci: Arch. di farmacol. sper., 1905, iv, Nos. 2, 3; Bioch. Zentralbl., 1905, iv, 240.
6. Denis: Jour. Pharmacol. and Exper. Therap., 1915, vii, 255.
7. Compare Hanzlik: Annual Report (1914) Therapeutic Research Committee, Council on Pharmacy and Chemistry, American Medical Association, 1915, p. 55.
8. Denis: Jour. Pharmacol. and Exper. Therap., 1915, vii, 601.
9. Dock: Tr. Michigan Med. Soc., 1895, xix, 121. Köster: Therap. Monatsh., 1892, vi, 117. Leonardi and Aster: Deutsch. Ztschr. f. prakt. Med., 1876, xxxiii, 367.
10. Oswald: Ztschr. f. exper. Path. u. Therap., 1910, viii, 226.
11. Hanzlik, P. J.: Jour. Pharmacol and Exper. Therap., 1912, iii, 387.

12. The reaction of the blood (H^+ concentration), using the method of Levy, Rowntree and Marriott (Arch. Int. Med., September, 1915, p. 389), in Patients 13, 14 and 15 was 7.4, 7.4 and 7.55, respectively, before salicyl, and 7.4, 7.4 and 7.55, respectively, at "toxicity." That is, the reaction was slightly alkaline and remained unchanged at "toxicity." This does not agree with the claims of certain clinicians that "toxicity" by salicylates is associated with or due to acidosis, and the reason for giving sodium bicarbonate with salicylate to prevent acidosis. More data are being collected for a future report in this connection.

some of the cases you might have the nonprotein nitrogen in the blood increased, in others decreased.

Dr. R. L. Wilbur, San Francisco: How long before this inflammation of the kidney subsides after the salicylates are stopped? Is there any difference from the administration of aspirin, etc., instead of the salicylates? Might it interfere with man passing a life insurance examination to have recently taken the salicylates? I have seen albuminuria where the question was an open one as to whether the albumin was due to the salicylates or to the acute condition for which the drug was taken or to permanent renal damage. The condition cleared up in a few weeks, but the insurance company was undecided whether the man was a proper risk or not, even after a delay of a year after such a finding.

Dr. Irwin J. Moyer, Pittsburgh: I presume Dr. Hanzlik has taken kidneys that are mostly normal before the administration of the salicylates. I would like to have an expression, however, as to how they do affect any previous renal condition. The question has been asked as to how long this continues. It is a common experience that the salicylates increase the elimination of uric acid for some time; but this soon subsides and I do not know that the salicylates increase the uric acid after a very definite length of time. It is a very practical question to determine what the effect of the salicylates are on the renal conditions.

Dr. Paul J. Hanzlik, Cleveland: As to whether or not urines were examined before the salicylate was administered—they were, in every case, and sometimes they showed albumin before the salicylate was administered, and in these cases the albumin is increased and does not disappear altogether after the salicylate is excreted. However, in a general way, the albuminuria ceases when the salicylate is excreted. The duration of the albuminuria is about three to four days after the administration of "toxic" doses of salicylate—in one case 110 hours; in another case 120 hours, and in still another, only fifty hours. There is a considerable variation. With repeated "toxic" doses we do not know what would happen in the human organism. In one animal, albuminuria appeared after each dose, three repeated "toxic" doses having been used, and there was a marked accumulation of nonprotein nitrogen in the blood, and marked cloudy swelling of the kidneys. As to what connection this has with life insurance I do not know, for we do not know how permanent these changes are. As far as the albuminuria is concerned, in those individuals who do not show albuminuria before the administration of salicylate, it is not permanent. I have not tried aspirin. The question of uric acid is interesting. It is true that the uric acid content of the blood is diminished following full therapeutic doses of the salicylates, but this returns practically to normal after the salicylate is excreted.

Drugs and Their Effects.—A discussion at a board of guardians in the Midlands as to the action of a medical officer in prescribing large doses of dangerous drugs, such as strychnin, says the *Medical Press and Circular*, Nov. 15, 1916, suggests the enormous number of drugs which are prescribed in everyday practice, and with whose actions the physician, save for some textbook knowledge, is usually not intimately acquainted. The nurse in a general hospital, if she be of an observant nature, must have often wondered why, in certain conditions, the same drugs, in the same doses, are always prescribed by the same man. She must frequently ask herself if the physician really is aware of what effect, if any, the medicine has had, and she must needs come to the conclusion that in the vast majority of cases the rule-of-thumb method is what most men work by. We have not far to go to obtain examples of drugs, which, in spite of their age long use, are still retained as active and frequently exhibited remedies, for the want of a proper knowledge of their effects. There are few house physicians who have not, at some time or other, been called to the bedside of a patient dying of pneumonia to inject some fraction of a grain of strychnin. In many of the modern textbooks $\frac{1}{30}$ or $\frac{1}{60}$ grain is still recommended in the heart failure of pneumonic patients, and yet is there any proof that either dose can be of the slightest value as regards the state of the heart?

APPENDICITIS AND PULMONARY TUBERCULOSIS *

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The facts here presented were based on my cases treated at Saranac Lake, N. Y., by the open air method from October, 1905, to June 19, 1916.

Patients who undergo climatic treatment for pulmonary tuberculosis have comparatively few serious digestive disturbances. One would hardly expect this to be so, as they are taking an increased diet, and many are taking either no exercise whatever or a limited amount of exercise. These patients, however, are constantly in the open air, and their whole habit of life is such as to keep them in the best possible physical condition. The digestive system seems to respond to the increased strain put on it, and unless there is some organic condition somewhere in it, it usually gives little trouble.

All lung specialists place great importance on a good digestion as an important requirement to give a good prognosis in cases with pulmonary phthisis. A patient with a bad digestion will always be given a guarded prognosis. It goes without saying that the examination of the patient is not complete without a careful inquiry into the digestive system, and also a careful physical examination of the abdomen.

Appendicitis and intestinal tuberculosis are the two organic conditions in the intestines which are most frequently encountered in treating patients with pulmonary tuberculosis.

It is well known that intestinal tuberculosis is one of the most serious complications that can occur in the course of cases of pulmonary phthisis. Up to the present time it has been considered a terminal complication. When our patients have developed positive symptoms of intestinal tuberculosis we have given them an absolutely bad prognosis. This rather hopeless view may be modified in the future, as some of these patients with intestinal tuberculosis may be much benefited by operation, that is, by removal of the disease in the bowel if the disease is not too disseminated. Up to the present time the results of operation have not been very encouraging.

The majority of cases of appendicitis occurring in patients with pulmonary tuberculosis have the usual classical symptoms. There are several types of cases which are not classical and which can easily be overlooked. One is that type of case in which there are more or less chronic symptoms of intestinal indigestion. The symptoms may be hardly definite or severe enough to direct our attention to the appendix, but by examining this organ we may find that the symptoms are due to a chronic appendicitis. My attention was first directed to such cases by Dr. J. R. Byers of the Laurentian Sanitarium of St. Agathe des Mont, P. Q., Canada. He informed me that he had given relief by operation to a considerable number of patients who had had these chronic symptoms of intestinal indigestion and which he had found to be caused by the appendix. I have found this to be true.

Another type which is frequently encountered in tuberculous patients occurs as a mild appendicitis. It

* Read before the American Climatological and Clinical Association, Washington, D. C., May, 1916.

* Because of lack of space, this article is abbreviated in The Journal by omission of tables and case histories. The complete article appears in the reprints, a copy of which may be obtained on application to the author.

frequently happens that the physician is called to see the patient on account of cramps in the abdomen. Advice may be asked of the physician over the telephone, as the patient may think that the cramps are of no importance. Such patients are usually taking a considerable quantity of milk. The usual advice given is for the patient to stop taking milk for some days and to take a dose of castor oil or some other purgative. The results that follow these directions are usually good, and frequently nothing more is heard from the patient. This, however, is not a safe procedure. It is much safer to see the patient and examine the abdomen. The physician will frequently find that such cramps are due to an appendicitis. I recall one case in which the cramps were of so slight a nature as scarcely to demand an examination of the abdomen. This case went to abscess formation and a fecal fistula. Had an examination of the abdomen been made at the onset, this condition would have been avoided. In another case the patient complained only of vomiting and of no pain in the abdomen. Examination revealed a well defined mass about the appendix and marked tenderness over this organ.

There is still another masked form of appendicitis which is emphasized by Dieulafoy and which we occasionally see in our pulmonary cases. The onset of this form is by diarrhea. If our patient has been taking large quantities of milk, we are apt to think that the diarrhea is due to the milk. We have become so accustomed to see constipation accompany appendicitis that we may not recognize appendicitis accompanied by diarrhea. An error in diagnosis may then readily occur. If a patient has abdominal pain and diarrhea, we should make frequent physical examinations of the abdomen and try to find the seat of the pain.

FREQUENCY OF APPENDICITIS IN PATIENTS WITH PULMONARY TUBERCULOSIS UNDERGOING CLIMATIC TREATMENT

From October, 1905, to June 19, 1916, I treated 727 patients with well established pulmonary tuberculosis. They were all under climatic treatment at Saranac Lake, N. Y. Of this number there were 425 males and 302 females. The total number of cases of appendicitis in the 727 patients was forty-three, or 5.9 per cent. Of this number, twenty-nine were males and fourteen were females. It is thus seen that the disease was more prevalent in the male than in the female. For instance, of the 425 males, twenty-nine had appendicitis, 6.8 per cent.; while of the 302 females, fourteen had appendicitis, 4.6 per cent. As regards age, four cases occurred up to and including 20 years; twenty-two occurred between 20 and 30 years (excluding 20 and including 30); twelve between 30 and 40 years, and five between 40 and 50 years.

These figures are similar to those obtained from the records of cases of appendicitis that occurred in apparently healthy persons. In my series as well as in all tables of statistics of the disease, it is seen that the disease is distinctly one of early life. The majority of cases occur up to and including the thirtieth year of life. Between 31 and 40 years a fair proportion occurs, while after 40 years the disease diminishes.

Sex plays a certain part, as the disease occurs in males more frequently than in females, according to all observers. There is no satisfactory explanation for this fact. Some authors have believed that the additional blood supply obtained in females through the appendiculo-ovarian ligament prevents obliteration of the circulation, thus obviating an important cause of the disease.

FREQUENCY OF OPERATION

Of the forty-three patients with appendicitis, twenty-eight were operated on, 65.1 per cent., and fifteen recovered without operation, 34.9 per cent. Of those who underwent operation, some were operated on during the attack and others during the interval. Of those who did not undergo operation, the symptoms were so mild in character as not to demand operation.

PROGNOSIS

Of the twenty-eight patients who underwent operation, three, or 10.7 per cent., died. Two deaths occurred on the third day, and one occurred four months following operation. The first case was one of fulminating appendicitis, and though operation was performed within twenty-four hours of the onset of the attack, there was already infection of the peritoneum, and the patient died on the third day after the operation. His case was moderately advanced, and he was in good physical condition. The second patient was operated on in the interval. He had a moderately advanced case and was in good physical condition. He had suffered from a mild attack of appendicitis, but a swelling in the right iliac region persisted. The diagnosis in this case was a probable case of localized intestinal tuberculosis. At operation this proved to be correct, and the appendix, cecum and ileocecal valve and part of the ascending colon were found to be tuberculous and were removed. On the third day after the operation the patient sank rapidly and died. The cause of his death was regarded as delayed shock, but no postmortem examination was made of the abdomen. Chloroform was used in the first case, and local anesthesia of novocain and epinephrin chlorid and then nitrous oxid in the second. The third patient was operated on in the interval. At operation the cecum and appendix were found to be tuberculous, and there was also extensive tuberculosis of the small bowel. The disease was so extensive that no cutting was done, and the abdomen was closed. Nitrous oxid and oxygen were used for anesthesia. The patient died four months later of general tuberculosis. She had a far advanced case and was in poor physical condition. All of the twenty-eight patients seemed to act well during the operation, and there were no deaths on the operating table.

The mortality of this series of forty-three cases (operative and nonoperative cases) was 6.9 per cent. (that is, three deaths in forty-three cases).

In the acute cases in which operation was performed, there was a mortality of 9.1 per cent. (one death in eleven cases). In the interval operations there was a mortality of 11.7 per cent. (two deaths in seventeen operations). Both these patients had extensive intestinal tuberculosis. It is of interest to compare this mortality, which occurred with patients suffering from pulmonary tuberculosis, with the mortality which occurs with patients free from tuberculosis.

Rotter's[1] statistics show that in 213 cases, 8.9 per cent. of the patients died. In twenty-one cases there was diffuse peritonitis on admission to the hospital. Of these patients, seven, or 33.3 per cent., recovered, while fourteen, or 66.6 per cent., died. The latter accounts for nearly two thirds of the total mortality

1. Rotter: Osler's System of Medicine, v, 429.

of 8.9 per cent. Of 192 cases with circumscribed perityphilitis, 156 patients (82 per cent.) recovered under medical treatment. Of the remaining thirty-six, thirty-three were operated on, and two died; three died without surgical intervention. There were, therefore, only five deaths (2.5 per cent.) among 192 cases of circumscribed perityphilitis.

Treves[2] states that the general mortality of perityphlitis in all its aspects has been estimated at 11 per cent. If an abscess forms, the mortality is raised to between 30 and 40 per cent.

Sahli[3] collected reports of 7,213 cases, of which 473 patients were operated on, while 6,740 were not. Of the latter group, 91 per cent. recovered. Recurrences took place in 4,593 cases; and of these, 3,635 recovered without further recurrences.

Up to the beginning of the year 1909, Schnitzler[4] had operated in 2,000 cases: 1,063 interval operations, with a mortality of 0.47 per cent. (five deaths), and 937 acute cases, with a mortality of 10.5 per cent. (ninety-nine deaths). It is thus seen that in these 2,000 operations there was a mortality of 104, or 5.2 per cent.

Comparing my series with these series, one sees that patients with pulmonary tuberculosis undergoing climatic treatment stand the operation for appendicitis exceedingly well.

FREQUENCY OF TUBERCULOSIS OF THE APPENDIX

In all cases in which operation was performed, careful search of the appendix was made to see if there was any tuberculosis present. Of the twenty-eight patients who underwent operation, well defined tuberculosis of the appendix was found in seven (25 per cent.). Five of these patients were in the moderately advanced and two in the far advanced stage of pulmonary tuberculosis. Tuberculosis of the appendix seems, therefore, to be present in the advanced stages of phthisis. None of the incipient cases showed evidence of tuberculosis in the appendix. Excluding the incipient cases, and combining the moderately advanced and far advanced cases, there was a percentage of 31.8 in which there was tuberculosis of the appendix (twenty-two cases, in seven of which there was tuberculosis of the appendix).

Primary tuberculosis of the appendix is believed to be very rare. In a few instances it has been encountered. Like other forms of intestinal tuberculosis, tuberculosis of the appendix is usually secondary to tuberculosis of the lungs. It may occur independently of other involvement of the intestines, but is more commonly found in association with tuberculosis of the cecum. Letulle states that in necropsies he has never found tuberculosis of the appendix without other lesions of the same nature in some other portion of the body.

Tuberculosis of the appendix seems to be more common in males (about 60 per cent.) than in females (40 per cent.).[5] The age incidence in sixty-four cases collected by Müller was: from 2 to 9 years, three cases; from 10 to 19 years, eighteen cases; from 20 to 29 years, twenty-one cases; from 30 to 39 years, sixteen cases, and from 40 to 47 years, six cases.

My statistics are few, but of seven patients with tuberculosis of the appendix four were males (57 per cent.) and three were females (43 per cent.). Four patients were between 20 and 30 years, one between 30 and forty years, one between 40 and 50 years, and one at 16 years.

In 3,055 operations for appendicitis from various sources, fifty, or 1.6 per cent., were found tuberculous.[6] These statistics correspond with those of Lockwood,[7] who states that it is found in 2 per cent. of the operative cases.

THE EFFECT OF THE OPERATION

One would think not only that these patients would stand operation badly, but also that the shock of the operation and the irritation of the anesthetic would have a bad effect on the disease in the lungs. First, with regard to the danger of operation: There were twenty-eight cases in which operation was performed. No deaths occurred during the operation. These patients were in all stages of pulmonary tuberculosis, and their physical conditions varied. Most of them were in good physical condition. All were under climatic treatment, and this fact may have had some influence on the way they stood operation. Four patients with advanced pulmonary disease were in poor physical condition. All stood the operation well. I can say, therefore, that the immediate danger from operation is slight, and does not seem to be more than that which occurs with healthy persons.

Secondly, with regard to the after-effects of the operation on the pulmonary disease and on the general condition of the patient: Of the twenty-eight patients operated on, there were two deaths within three days of the operation and one death within four months. One patient died of a septicemia following a fulminating appendicitis; one patient died of probable delayed shock following a serious operation for removal of the appendix, cecum, part of the ileum and part of the ascending colon, all of which were tuberculous; the third patient failed rapidly after operation, and died within four months. No cutting was done in this case, as extensive disease of the appendix and bowels was found, and it was impossible to remove all the disease. This patient was failing rapidly previous to operation, had a far advanced case, and was in poor physical condition. In 10.7 per cent. of cases (three in twenty-eight) there was a bad effect from operation. In twenty-five cases (89 per cent.) there was no bad effect on either the general or the lung condition. These patients stood the operation remarkably well, and within a short time were just as well as they were before operation. The operation seemed to have no ill effect whatever on the lungs. Many of them showed a remarkable improvement and gained rapidly in weight. Of the seven patients who had tuberculosis of the appendix, one is alive, well and at work, one died within a year of operation, one died four years after operation, one died four months after operation, and one died three days after operation. The two remaining patients are still under treatment for their pulmonary tuberculosis and are doing well.

CHOICE OF AN ANESTHETIC

When a general anesthetic is employed, that one should be used which is safest and which will cause the least irritation to the lungs. Occasionally in my series of cases a local anesthetic of epinephrin chlorid and novocain was used and acted well. This can be used in only a limited number of cases, but if it can be used, is to be preferred above all other anesthetics,

2. Treves: System of Surgery, ii, 627.
3. Sahli: Osler's System of Medicine, v, 429.
4. Schnitzler: Keen's Surgery, vi, 553.
5. Keen's Surgery, vi, 571.
6. Müller: Keen's System of Surgery, vi, 571.
7. Lockwood: Osler's System of Medicine.

as it diminishes to a minimum the danger of shock, and causes no irritation to the lungs. It was used in two of my cases with complete satisfaction.

If local anesthesia cannot be employed, the combination of nitrous oxid and oxygen is, in my judgment, the anesthetic of choice. This was used in twenty cases. One patient died of probable delayed shock on the third day after operation. The appendix and cecum and part of the ascending colon were removed on account of tuberculous disease. A second patient grew rapidly worse after operation and died in four months. Here no cutting was done on account of extensive intestinal tuberculosis. In both cases the anesthetic did not seem to cause any irritation to the lungs. In the remaining eighteen cases in which nitrous oxid and oxygen were used for anesthesia, there was no evidence whatever of any irritation to the lungs, and the lungs did not suffer in any way as a result of operation. Chloroform was given in three cases. One of these patients had a fulminating appendicitis and died on the third day after operation. The remaining two patients experienced no ill effects on the lungs from this anesthetic.

Ether was given to three patients, and all three experienced no ill effects whatever on the lungs from this anesthetic.

The prevailing opinion seems to be that ether should not be used on patients with pulmonary tuberculosis on account of its irritating the lungs. Chloroform is less irritating than ether, but is more dangerous to the life of the patient. In the hands of a reliable anesthetist, it is to be preferred to ether in these cases. Nitrous oxid and oxygen is, in my judgment, the anesthetic of choice to be used in these cases. In my cases it proved to be satisfactory in every way, and there was no sign of irritation to the lungs. Dr. John B. Murphy[8] suggests the use of spinal anesthesia in cases of tuberculosis of the appendix, but I have had no experience with it. In the discussion which took place at Washington in May, 1916, at the meeting of the American Climatological and Clinical Association on the choice of an anesthetic for patients with pulmonary tuberculosis, physicians from Colorado spoke very highly of the safety of ether in such cases when given by the drop method. They regard ether to be just as safe and just as suitable as nitrous oxid and oxygen, and to be just as free from harmful after-effects, provided it is given by this method.

THE QUESTION OF OPERATION

Here we have to consider appendicitis in its acute form, and in its mild or chronic forms. In my cases, when appendicitis occurred acutely, there was a mortality of 9 per cent. (one death in eleven operations for acute appendicitis). In 937 operations for acute appendicitis, Schnitzler had a mortality of ninety-nine, or 10.5 per cent. Of twenty-eight patients of all classes of my cases, that is, acute, mild and chronic appendicitis, who were operated on, there was a mortality of 10.7 per cent. (three deaths in twenty-eight). From careful observation of my tuberculous patients not only during but also after operation, I believe that these acute cases should be regarded as we regard apparently healthy patients, and that the lung condition should be excluded when we are making our decisions as to whether or not to operate. I think that this belief is justified from the facts that there were no deaths during operation, and that there were no bad effects on the lungs as a result of operation, and also because the mortality from operation was almost the same as in healthy persons. Patients with pulmonary tuberculosis stand the operation for appendicitis remarkably well. This conclusion applies also to pulmonary patients in a feeble condition. These patients also stood operation remarkably well.

When the appendicitis is mild or chronic, I think the pulmonary condition should be considered. When mild or chronic attacks occur in patients in good physical condition, we should choose a time for operation which is most suitable. Many factors will influence the time to be chosen. Such patients stand operation well, and should be treated as we treat healthy persons. Their lung condition should not be considered against the danger or detriment to their health from appendicitis.

When mild or chronic attacks occur in patients in feeble or poor physical condition, the question of operation should be decided only after careful consideration. Each case must be considered by itself. Such patients stand operation well. Should repeated attacks endanger their health or keep them from taking sufficient nourishment, the appendix should be removed. I have seen remarkable improvement in such cases follow operation. One patient (a feeble woman with an advanced case), gained in weight from 85 to 135 pounds as a result of operation, a gain of 50 pounds, and there was a corresponding improvement in her lung condition.

8. Murphy, J. B.: Keene's Surgery, vi, 571.

POLYCYTHEMIA

PRELIMINARY REPORT OF A CASE WITH A HITHERTO UNDESCRIBED INCREASED RESISTANCE OF THE RED CELLS TO HEMOLYTIC AMBOCEPTOR *

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In the reports by Lutenbacher[1] and by Lucas,[2] both reviewing the literature up to 1912, 196 unquestionable cases of essential polycythemia are described. Since then about fifty cases have been added. Polycythemia, polycythemia rubra (from the color of the skin), erythremia, Vaquez' disease or Osler's disease, as it is variously called, was first described by Vaquez in 1892. It shows a persistent, causeless increase of the red cells in the blood, chronic cyanosis, usually a large spleen, and the absence of cardiac, renal or other circulatory disturbance that might account for the symptoms.

Symptoms.—Cyanosis is nearly always present. The general appearance has been strikingly described as "Indian red." The skin, especially where thin, as that of the nose, ears and about the eyes, and that of the lips and the mucosa of the mouth, is bluish or purplish. Plethora is manifested in the skin by swollen veins and capillaries, and in the alimentary tract by digestive disturbances, of which vomiting, obstinate constipation and spontaneous hemorrhages are the chief. Dyspnea on slight exertion results from the engorgement of the lungs.

* Read before the San Diego County Medical Society, June 6, 1916.

1. Lutenbacher, R.: L'érythrémie, Paris, G. Steinheil, 1912. This monograph covers the entire subject thoroughly.

2. Lucas, W. S.: Erythremia, or Polycythemia with Chronic Cyanosis and Splenomegaly, Arch. Int. Med., December, 1912, p. 597. This is a review of cases to 1912.

In spite of the increased viscosity of the blood and the increased proportion of cells to plasma, the blood pressure is usually normal, and the right heart is not hypertrophied. In a form of polycythemia reported by Geisbock,[3] characterized by hypertension, this is a complication, due to coexisting arterial or renal disease. The cardiac examination should rule out the existence of lesions sufficient to provoke a compensatory erythrocytosis. The Roentgen ray should supplement the stethoscopic examination in doubtful cases.

In the majority of cases a trace of albumin, and not infrequently casts are found. The glandular system is normal. The temperature is unaffected.

Nervous System.—Nearly all the cases show cerebral symptoms. Syncopal sensations with or without loss of consciousness, vertigo, Ménière's syndrome and paralyses are reported. A changed mental state is usual, with general depression, irritability, amnesia or insomnia. Headache is common. Neuralgic pains, pains in the left hypochondrium, sensations of fulness in the head, hot flashes, and later sensations of cold, are usual.

Spleen.—Splenomegaly does not form an integral part of the picture, although present in about three fourths of the patients, even reaching the iliac fossa. The enlarged spleen may precede the increase in red cells. The liver is sometimes slightly enlarged as a result of the plethora.

Hematology.—The red cell count varies normally between 4,500,000 and 5,500,000. The limit for a healthy man in a low altitude is about 5,800,000. In polycythemia the red count is over 6,000,000, usually between 7,000,000 and 11,000,000. In thirteen cases, counts of 12,000,000 or over have been described, the highest two (those of Seufert[4]) being 15,000,000 and 15,500,000. The number varies at different times in the same patient, the range being about 1,000,000; but in seven cases the range was from 3,000,000 to 4,500,000.

Several cases have been seen in the anerythremic period. Lutenbacher's patient had cyanosis four years and enlarged spleen one year, before coming under treatment. At that time the red cells were only 4,800,000, but rose gradually to 9,000,000 in the course of a year.

With the reds the leukocytes are increased, averaging 15,000, but may be normal, or 30,000 or over. The polymorphonuclears show characteristically an increase from the normal proportion of 60 per cent. to 80 per cent. or more, the eosinophils from 3 to 9 per cent., at the expense of lymphocytes.

The red cells are mature cells, practically normal in appearance, but medullary hyperactivity is shown by the presence of small numbers of nucleated reds, of polychromatophilia, and myelocytes, in slight degree at least, in the majority of cases. The color index is less than unity. The hemoglobin is increased, but not in exact ratio to the red cells; from 125 to 150 per cent. is reported, "up to the limit of the scale"; one case had 240 per cent. hemoglobin. In other chronic cyanoses the size of the red cells is larger than normal, about 8 microns, in the polycytosis of altitudes smaller, averaging 6 microns. In polycythemia the cells are of about average size, and even compose nine tenths of the whole blood. Where the cell count is very high, the cells are necessarily smaller, and microcytes are present.

In the few cases in which the tests were made, the resistance of the globules to hypotonic solutions and to other serums was normal (except one, mentioned further on).

The blood is darker than normal. The viscosity is increased. Weber found it twice normal in two cases. The coagulation time is shortened. The oxygen capacity increases proportionately to the hemoglobin. The total volume of the blood is increased, in the few estimations being from two to three times the normal amount for the weight. There is then a real plethora.

Pathologic Anatomy.—The liver shows enlarged blood capillaries, as do other organs. The spleen in the cases with splenomegaly shows active congestion, but no essential histologic change. One case showed increased erythrolytic activity of the macrophages. The enlargement of the spleen has been found due to tuberculosis, syphilis and malaria, and in these cases it may be supposed that the polycythemia is secondary to the changes in the spleen, and the loss of erythrolytic action. This was proved true in a case of Rist and Parvu[5] with a red count of 7,700,000; after the extirpation of an ecchinococcic cyst of the spleen the polycythemia and cyanosis were cured. Such cases are not the essential polycythemia, and the same is true of cases of portal or splenic stasis from thrombosis, phlebitis or cirrhosis of the liver, in which the stasis is the cause of the increase of the reds and of the enlarged spleen.

The pathognomonic change is in the bone marrow. The fatty marrow of the long bones normal in the adult is replaced by that of a red fetal type, very vascular, and showing active production of red cells.

The anatomic examination proves the myelogenous origin of true polycythemia.

Etiology.—The age of onset is usually between 40 and 60. Sex, race and other factors seem to be unimportant.

Metchnikoff assumes that some toxin of a hemolytic nature is manufactured by the spleen and is absorbed in the circulation in minute quantities, not sufficient to cause hemolysis, but sufficient to excite a reaction in the blood-forming organs. Experimentally minute doses of a hemolytic serum injected into the blood of anemic individuals has raised the number of reds, and the amount of hemoglobin.[6]

The cause of polycythemia is unknown. It is comparable to leukemia, and, as that is a hyperblastosis, a tumor of the tissues forming leukocytes, polycythemia or erythremia is a hyperblastosis, a tumor of the tissues forming erythrocytes. There are transitional cases, as Blumenthal's,[7] in which the myelocytes numbered 36 per cent., along with a red count of 11,450,000.

Course.—There is an anerythremic phase in which the medullary reaction is compensated for by the hyperactivity of the spleen, destroying the red cells, and preventing the development of erythrocytosis. Later come crises of plethora, increase of the red cells, cyanosis, vertigos, headaches and neuralgias. The disease is progressively but slowly fatal, with a duration of from ten to fifteen years. With the hyperemia hemorrhages are frequent, occurring in about a fourth of the cases. Epistaxis, bleeding gums, hematoma hematemesis and melena are reported. Two patients

3. Geisbock, quoted by Lutenbacher: Deutsch. Arch. f. klin. Med., 1905, lxxxiii, 396.
4. Seufert, E. C.: Am. Jour. Med. Sc., 1910, cxl, 832.
5. Rist, Kindberg and Parvu: Soc. méd. d. hôp., 1910, cited by Lutenbacher (Footnote 1).
6. Belonovsky: St. Petersburg, 1902, cited by Lutenbacher (Footnote 1).
7. Reported by Lutenbacher (Footnote 1).

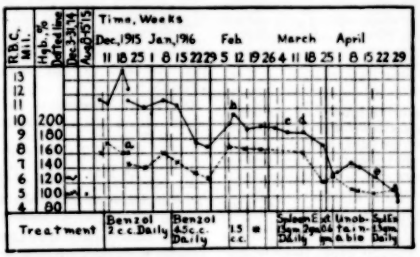
had transitory relief after menorrhagia. Ten patients (aged from 28 to 53, averaging 42) had cerebral hemorrhage or thrombosis; and cerebral hemorrhage, or hemorrhage from the gastro-intestinal tract may be the cause of death.

Diagnosis.—The diagnosis is made on the presence of polycythemia with cyanosis, symptoms of cerebral congestion, polymorphonuclear increase, and, usually, an enlarged spleen. The increase of red cells must be absolute and persistent, and circulatory disturbance of cardiac, pulmonary or other origin must be ruled out.

The relative polycythemias due to prolonged vomiting, severe diarrhea (cholera), other causes of loss of fluid, and to pyloric stenosis must be excluded. Friedman[8] reported twenty-five cases of gastric and duodenal ulcer, and pancreatic disease with very high red counts. The forms due to high altitude, to congenital heart disease, to mediastinal tumors, and the occasional high counts after a hearty protein meal must not be confused.

Treatment.—Three patients died soon after splenectomy. Venesection, without result in three cases, furnished transitory relief in seven others. Of chemical agents, iron, quinin, arsenic, the salicylates, oxygen inhalation and many others have been useless, and of biologic agents, thyroid, pituitary extract and tuberculin were without effect.

Aside from one patient cured by applications of the Roentgen ray to the spleen (several others were treated without change) benzol (benzene, C_6H_6) has the only cures to its credit. After its use in leukemia it was suggested for polycythemia, and reports of five cases were collected by McLester,[9] including his own, in which an apparent cure had been effected, besides one other in which it had no effect.



Polycythemia: *a*, venesection; *b*, hemolytic resistance, five times normal; *c*, hemolytic resistance over four times normal; *d*, hemolytic resistance over two times normal; *e*, hemolytic resistance normal; * indicates spleen, raw, 25 gm. daily.

REPORT OF CASE

A man, aged 54, who had been under the care of Dr. Oatman since Dec. 7, 1915, gave a history of having been a robust, active business man until February, 1914, when he had a stroke, leaving a partial hemiplegia of the right side. In October of the same year a second stroke occasioned an increase of the right sided palsy, from which recovery was also practically complete. From this time on irritability, querulousness, and carelessness in money matters accentuated themselves to the point at which he had to be kept away from business.

The cyanosis began gradually, and was noticeable by December, 1914, when at each of four weekly examinations the polycythemia was noted, about 6,500,000 reds, hemoglobin 108 per cent., white count 16,000 and 10,000. Blood pressure, systolic, 138 to 168; diastolic, 104 to 124. Pulse, 80. During 1915 he was examined several times; the polycythemia was present (11,000,000?) but the record not obtainable. He was treated with small doses of benzol without effect. Many details are unobtainable, owing to his mental state at the time. Two blood counts in August, 1915, showed 6,300,000 reds; whites, 9,000; hemoglobin, 105 per cent. A weakly positive Wassermann reaction was reported.

Dec. 7, 1915, examination revealed a rather large framed man, of very dark, cyanotic appearance, weak, slow and uncertain in movement, cheerful at times, and with a marked loss of recent memory. With his attendants he was quite irritable.

The subjective complaints were of vertigo, and dizziness on standing or attempts at walking, painful sensation of cold in the hands and feet especially, and neuritis in the right leg preventing sleep. He had obstinate constipation.

The color of his nose, ears, and particularly of the lips and tongue was a dark purplish. The venules of the skin were distended. In the muscular system there was marked weakness. The grasp was uncertain. The patient walked slowly and with difficulty, partly owing to weakness, partly to the right foot drop, partly to the dizziness. Control of the fingers was poor.

The glands were not palpable. Examination of the heart and lungs was negative. There was some dyspnea on exertion. The pulse was normal, blood pressure, systolic, 160; diastolic, 100. The urine gave a trace of albumin. Temperature was normal the whole period of observation. Liver and spleen were not enlarged to percussion, nor was the spleen palpable. Reflexes were normal except for absence of the right patellar. Sensation was normal. Speech was slow. Amnesia was marked, and there was disorientation at times.

Blood.—The blood was very dark, viscid, spreading with difficulty on the slides. Fresh blood was negative. Hemoglobin 160 per cent. (taken with Sahli), equivalent to 22 gm. hemoglobin instead of the normal 14 gm. per hundred c.c. The white count was 22,200; red cells, 11,720,000; color index, 2/3. Differential count: polymorphonuclears, 87.25 per cent.; lymphocytes, 6 per cent.; mononuclears and transitionals, 5.75 per cent.; eosinophils, 0 per cent.; basophils, 1 per cent. There were no nucleated reds. Some of the platelets were two-thirds the size of the red cells.

Benzol, 2 c.c. daily, was started December 9 (McLester's mixture was used).

The highest count was December 18, reds 13,862,000; hemoglobin, 160.5 per cent.; leukocytes, 21,600; microcytes present in large number.

December 21, Dr. Oatman performed a venesection, removing over a liter (quart) of blood, and replacing it with saline solution. During this operation the patient's color changed to the healthy pinkish tint normal in one with dilated capillaries. The blood count an hour before venesection after twelve days of benzol therapy was 12,324,000; hemoglobin, 160 per cent. Differential count: polymorphonuclears, 81.85 per cent.; lymphocytes, 10.55 per cent.; mononuclears, 4.15 per cent.; (700) transitionals, 1.40 per cent.; eosinophils, 1.55 per cent.; basophils, 0.55 per cent.; myelocytes (neutral), 0.55 per cent. We wished to estimate the total volume of the blood with vital red, by the method of Keith, Rowntree and Geraghty,[10] but there was none of the drug in the country. The liter removed was possibly a fifth or sixth of the total quantity. Four hours and a half after the operation the patient looked as cyanotic as before, reds, 11,740,000; hemoglobin, 150 per cent.

By January 12 he seemed stronger and better, had better use of his fingers, his mental state was clearer, and he could walk short distances, in spite of the blood picture remaining about the same. The benzol was increased to 4.5 c.c.

8. Friedman: Progr. Med., 1914, ii.

9. McLester, J. S.: Benzol in the Treatment of Polycythemia Rubra, THE JOURNAL A. M. A., May 2, 1914, p. 1381.

10. Keith, N. M.; Rowntree, L. G., and Geraghty, J. T.: A Method for the Determination of Plasma and Blood Volume, Arch. Int. Med., October, 1915, p. 547.

per day. The pain in the right foot and leg was severe at this time. Injections of the nerve by Dr. Byars, during the absence of Dr. Oatman, gave relief.

Blood counts around 8,000,000 led us to think he was improving, but apparently it was only one of the oscillations common in these cases, as the polymorphonuclears remained about 80 per cent.; lymphocytes, 12 per cent.; eosinophils, 3 per cent., and February 7 the count was 10,000,000.

The benzol was reduced on account of the poor appetite of the patient. A Wassermann test on this date was negative. His cells formed eight-ninths of the total blood mass, instead of 50 per cent., normal. The patient's corpuscles showed no hemolysis against two units of antihuman amboceptor (twice the amount necessary to hemolyze normal corpuscles) in equal volume percentage (5 per cent.). The following day on titrating the patient's corpuscles against antihuman amboceptor, in order to hemolyze his corpuscles, it was found necessary to use five times the quantity of amboceptor used to hemolyze normal corpuscles (details in accompanying table). The resistance to hypotonic solutions was found to be normal, hemolysis beginning at 0.48 per cent. saline and complete in 0.30 per cent. saline. (Corpuscles added to solutions from 0.20 per cent. salt to 0.60 per cent. by 0.01).

RESULTS OF TITRATION *

Amboceptor Units	Complement Units	Patient's Corpuscles, 5%, C.c.	Result†	Normal Corpuscles 5% 0.1 C.c., Complement 1 Unit	
				Ambo. Units	Result
1	1	0.1	0		
1.5	1	0.1	h/2		
2.5	1	0.1	h		
4	1	0.1	hhh	4/5	hhh
4.5	1	0.1	hhh	1	hhhh
5	1	0.1	hhhh	6/5	hhhh‡

* No hemolysis with antisheep amboceptor.
† Complete hemolysis is indicated by hhhh.
‡ 2 units, hhhh, etc.

Although the theory of a greater resistance of the cells has been advanced, previous reports have not detailed any work tending to prove or disprove the idea, with the exception of the work of Guinon, Rist and Simon,[11] whose patient had cells showing a slightly greater resistance to hemolysis in hypotonic solutions, and the cases reported by Weber,[12] and by Lutenbacher, which were normal. However, the cell resistance in these cases was tested against dilute salt solutions, against normal serum, and antisheep amboceptor. No one tested the cell resistance to *antihuman* amboceptor. Since our case was examined, Freund and Rexford[13] have reported a case of polycythemia in which this test was made and the cell resistance found normal.

February 16, apparently on the up curve of the red count, raw spleen was administered, from 25 to 30 gm. per day, and continued until February 25. From March 2, splenic extract, 1.3 gm. daily, was administered.

A hemolysis test, March 6, showed a resistance to antihuman amboceptor of over four times that of normal corpuscles. By March 13 only two times that amount of amboceptor was required. As the red count was stationary, the splenic extract was increased to a dose of 2 gm. a day. March 24, the hemoglobin dropped to 120 per cent., reds 8,680,000. The dose of spleen was reduced to 0.6 gm. daily until March 28. The cyanosis was almost gone, mental condition and general condition were greatly improved, and memory was good. A cystitis had become troublesome, hematuria was said to have occurred March 27, but urine examination, March 28, showed no blood, urophein or urohematin (blood destruction). The differential count was normal.

During the time the splenic extract was not obtainable, the red count rose to over 7,000,000. April 17, 1.3 gm. of dry spleen were given daily again, the hemolytic test showed a normal resistance to antihuman amboceptor, hemoglobin was normal, and the cell count likewise. The treatment was then discontinued for a month in order that results might be watched.

Blood examination, June 27, two months after the last examination shown on the chart (April 29), without treatment, was as follows: hemoglobin 106 per cent.; red count, 4,980,000; whites, 9,200; blood pressure, systolic, 170; diastolic, 90; differential count, normal; hemolytic resistance, normal.

COMMENT

In this case with a small spleen, the destruction of the red cells was evidently at fault, although the hyperactivity of the marrow is shown in the blood picture. The inactivity of the spleen is shown in the effect of administering extract of spleen, and in the increased resistance of the red cells to destruction by a hemolytic agent (antihuman amboceptor). It is possible that Metchnikoff's theory of causation is correct in this case, namely, that minute doses of hemolysin are being taken into the circulation, possibly from an atrophic spleen, in quantity sufficient only to stimulate the formation of red cells, and in our case, the genesis of cells of increased resistance to the hemolytic agent. This theory is supported by the fact of the several tests, and by the result of the therapy with spleen, with the idea of stimulating this organ. First there is a flattening of the curve of the red count, and the absolute reduction of the count with larger dosage of spleen; a slight increase on suspension of the extract, and prompt reduction on its resumption. Further observation will clear up this point.

Polycythemia is a very rare disease, but the opposite blood picture, pernicious anemia, is common. The present case is suggestive of new lines of work in anemia.

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11. Guinon, Rist and Simon: Bull. et mém. Soc. med d. hôp. de Paris, 1904, Series 3, xxi, 786.
12. Weber, Lancet, London, 1906, ii, 1433.
13. Freund, H. A., and Rexford, W. K.: Serologic Examinations in a Case of Polycythemia, Arch. Int. Med., March, 1916, p. 415.

THE CONTROL OF THE NAUSEA AND VOMITING OF PREGNANCY

BY INTRAMUSCULAR INJECTIONS OF CORPUS LUTEUM EXTRACT

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A preliminary report on this subject has already appeared.[1] Herewith is presented the result of further experience.

THEORY

Every woman, during the period of sexual activity, is constantly absorbing corpus luteum. No sooner is the corpus luteum of one menstruation disposed of, than another appears to take its place. With the onset of pregnancy, this absorption ceases. The corpus luteum of pregnancy constantly increases in size, until it reaches its acme about the third month. From this time on, it is gradually absorbed. The nausea of pregnancy, beginning during the period of nonabsorption, disappears about the time that the corpus luteum begins to decrease in size. Is it not reasonable to assume that this is not coincidence, but cause and effect, and that the corpus luteum plays an important part in relation to the nausea?

Based on this idea, corpus luteum extract was administered intramuscularly, with the results shown below.

CASE RECORDS

It has now been used in twenty-five consecutive cases, taken without any attempt to choose the favor-

1. Hirst, J. C.: Corpus Luteum Extract in the Nausea of Pregnancy, THE JOURNAL A. M. A., Feb. 26, 1916, p. 645.

able or eliminate the unfavorable. It was successful in controlling the nausea and vomiting in twenty-one of the twenty-five. In four it proved a complete failure, and did not in any way check the vomiting. The essential points regarding the successful cases will be presented under the heading of dosage, as I think it unnecessary to detail the histories of the twenty-one successes. The failures offer a more interesting field:

FAILURE 1.—Primipara (Case 4 in the preliminary report), aged 24, with severe nausea, received four doses of 1 c.c. each, and was worse than ever. The nausea was finally controlled by lavage and large doses of bromid, but there was no effect from the corpus luteum. This patient has a large goiter, which may or may not be a factor in her case. She was delivered, Aug. 9, 1916.

FAILURE 2.—Quadripara with severe nausea, eight weeks pregnant, received five doses of 1 c.c. each with absolutely no beneficial effect. This patient is the only one who showed any reaction to the extract. The reaction took the form of severe hives, with intense itching, all over the body. She had had a similar reaction to an immunizing dose of diphtheria antitoxin two years previously. When she was ten weeks pregnant, she suddenly developed dysuria. On examination, a retroversion of the gravid uterus was discovered. This was replaced, and the nausea ceased almost at once. This was evidently a case of the reflex type, and certainly was not influenced by the corpus luteum extract.

FAILURE 3.—Primipara, nine weeks pregnant, farmer's wife, received twelve doses of 1 c.c. each, with no good effect. She then refused further treatment, and the nausea persisted until the fourteenth week. In this patient, there does not seem to have been any palliative of the failure, such as might be suspected at least in the first two.

FAILURE 4.—Tertipara with severe nausea, who had had similar nausea in the other pregnancies, received twelve doses of 1 c.c. each, and then treatment was discontinued as no good effect was noted. The nausea was not in the least relieved. Here also there are no palliating circumstances.

Of the successful cases, two were of the pernicious type, in which the vomiting was so severe that the termination of pregnancy was seriously considered. In one of these, fourteen doses were given (two daily, 1 c.c. each) and in the other, seventeen (also twice daily). In both, the vomiting was entirely controlled.

The smallest number of doses in any successful case was four. This patient showed such a prompt response that I am confident her vomiting was neurotic in type and would have been controlled by any method of treatment which made a similar mental impression.

The largest number of doses was forty-two. This was in Case 5 in the preliminary report. The patient had previously had two hydatid moles, so that this was her third pregnancy. There was no need of further treatment after the tenth dose, as the nausea had ceased. The treatment was continued on the chance that it might have some effect in preventing a third mole. The patient was delivered at term of a female child, Aug. 8, 1916.

The average number of doses required in successful cases was eleven.

DOSAGE AND METHOD OF ADMINISTRATION

In the average case of nausea, in which it amounts only to discomfort, and the vomiting is limited to one or two morning attacks, the patient will usually respond to a dose of 1 c.c. every other day for five or six doses. Particularly is this true in the cases in which the nausea has begun to decline. In these cases the effect is almost immediate. In the more severe cases, when nausea is constant, and the patients are subject to frequent paroxysms of vomiting at any time during the day, the dose should be 1 c.c. daily for from twelve to fifteen doses. During the period of treatment, the patient's activity should be curtailed, and as much rest as possible is essential.

In the pernicious cases, I have given 1 c.c. twice daily, and should not hesitate to give more than this. These patients are confined to bed, of course.

The doses suggested above are average only, and I should not hesitate to give 2 or more cubic centimeters to a dose in severe cases in which a decision as to the value of the method must be reached without delay.

The site of the injection is prepared by cleansing with tincture of green soap and alcohol. The deltoid is my preference. The syringe used is glass, and it and the needle are boiled, and allowed to cool before the extract is drawn up from the ampule.

Alcohol is not a safe antiseptic to prepare a syringe for injection of any animal extract.

The site of the injection is gently massaged for a minute or two after the needle is withdrawn.

All injections are given deep, into the muscle, and *never* subcutaneously.

MATERIAL

The material used is in ampules, containing ⅓ grain of soluble corpus luteum powder in 16 minims of physiologic salt solution saturated with chlorbutanol for its local anesthetic effect. This amount is equivalent to 2½ grains of desiccated corpora lutea.

As to the sterility of this preparation, I have no misgivings. In several hundred injections, there has not been a single abscess. There is sometimes a red area around the site of the injection, for twenty-four hours, which is slightly tender, and this is less common the deeper the injection is given. A compress of alcohol and water, equal parts, promptly relieves this. Except in one case (Failure 2) there has been no general reaction and no anaphylaxis. The reaction in the case mentioned was of short duration, and occurred in a person evidently markedly susceptible. Not one of the patients aborted. This is somewhat remarkable. With the normal ratio of 25 per cent., it would not have been unusual if six had done so. Theoretically, at least, there should be some risk of abortion in the use of luteum extract, but the facts do not confirm the theory. At the very least, it can be stated definitely that the method does not add to the risk of abortion.

Another curious fact is the sedative action in markedly neurasthenic cases. Not only was the nausea improved, but also the patients' nervous phenomena. The dizziness, headache and other nervous manifestations of early pregnancy seemed to be remarkably controlled.

The percentage of success in this series (84) coincides with that of the preliminary report (80). As the cases were not selected, but taken consecutively, I see no reason why the results in a much larger number should vary far from this. It is too much to claim, in a subject so complex as the nausea of pregnancy, that any single agent should prove specific. Based on the foregoing results, however, it seems justifiable to assert that here is an important factor which heretofore has not received the attention it deserves, and it is my hope that more extended trial by the profession at large will prove that this assertion is not unfounded.

Since preparing this article additional cases have been observed, making a total of thirty-two successful cases of thirty-six studied.

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Therapeutics

DISTURBANCES OF THE KIDNEYS

(Continued from page 1759)

CREATIN AND CREATININ

Creatin is methyl-guanidin-acetic acid. Creatinin is an anhydrid of creatin.

Creatinin is a normal constituent of the urine, and the daily excretion is from 1 to 2 gm. It is both of exogenous and endogenous origin.

Many investigators have found that in nephritis there is retention of creatinin in the blood, and it has been found that if over 5 mg. of creatinin per hundred c.c. are retained, the outcome is fatal. The creatinin retention probably follows, and is coincident with the nonprotein nitrogen retention of the blood. It has been shown that there is a slight increase of the creatinin in the blood after a full meal, and in infections.

The creatin and creatinin content of the blood of children was recently investigated by Veeder and Johnston,[30] who examined seventy-five children in various stages of scarlet fever. They found that there is no apparent relationship between the amount of creatin and creatinin, but there is less creatin in the blood of children than in the blood of adults. On the other hand, creatin is found normally in the urine of children, but is not present in the urine of adults. Contrary to previous presumption, these investigators did not find any definite relation between the total nonprotein nitrogen and the creatinin-creatin content of the blood.

As stated, creatin is a normal constituent of children's urine, but is rare in the adult. The relation of the creatinin output to the amount of muscular tissue in adults is not the relation of the creatinin to the muscle tissue in children before puberty.

Cutler and Morse[31] have lately found in two children with nephritis no relation between the creatin and creatinin output and the amount of the fever.

Rose[32] and others, in experimental studies on creatin and creatinin, find that, contrary to the general belief, protein feeding in a starving man promptly reduces the creatin output to nothing. Administration of large doses of creatin in an ordinary individual causes some increase in the output of creatinin. This increase is doubtless due to the conversion of creatin intake to creatinin, and not to an increased output of endogenous creatinin.

EXPERIMENTAL NEPHRITIS

It cannot yet be definitely proved by tests of function exactly which parts of the kidney are pathologically affected. This has been shown recently by Frothingham,[33] though Potter and Bell[34] state their belief that an experimental tartaric acid nephritis shows that phenolsulphonephthalein, indigocarmin and methylene blue are excreted by the convoluted tubules. In acute glomerular nephritis caused by scarlet fever there is often a complete suppression of urine, that is, no water is passed by the kidneys. This bears out the belief that most of the water of urine is secreted by the glomeruli.

It has not been shown that the kidney has an internal secretion; it can, however, synthesize hippuric acid from glycocoll and benzoic acid, salicylic acid from salicylic acid and glycocoll. Uric acid has been shown to be excreted by the convoluted tubules and by the ascending loop of Henle, and urine leaving the Bowman capsule is alkaline, becoming acid in the convoluted tubules.

Christian,[35] in summing up some practical results obtained from experimental nephritis, states that the administration of diuretic drugs, such as potassium acetate, caffein, theobromin sodium salicylate, theocin, and even water, shortens rather than prolongs the lives of these animals. Even when one or other of these drugs at first stimulates the excretion of urine, it soon lessens the excretion and does harm. Therefore not only should renal irritants not be given, but even renal stimulants should not be used in the therapy of acute or subacute nephritis. Large amounts of potassium salts, chlorids and iodids, and the substitution of potassium chlorid for sodium chlorid caused poisoning in the animals which were suffering from experimental nephritis. Hence such drugs must be dangerous to human beings who have acute nephritis, and even large amounts of water may do harm by first promoting excretion and then wearying defective kidneys. Therefore, as noted by Christian, after diuresis there is often a lowered output of nitrogen.

ABNORMALITIES OF THE URINE

A person weighing 50 pounds should normally excrete about 32 gm. of solids in the urine per day; one weighing 100 pounds, about 57 gm.; one weighing 150 pounds, about 76 gm., and one weighing 200 pounds, about 88 gm. Girls and women ordinarily do not excrete as large an amount, owing to a less active life. After the age of 40, the excretion generally diminishes progressively, in some cases becoming 30 per cent. less after the age of 60.

A simple method of computing the total solids in the urine is to take the specific gravity of the twenty-four hour specimen, multiply the total number of ounces of this specimen by the last two figures of the specific gravity, and add to it 10 per cent. of the figure thus obtained. The result will be the total amount of solids passed, provided the urine does not contain albumin or sugar.

With retention of chlorids in the body there is also a retention of water, but with the free excretion of chlorids, the water excretion is also increased.

The following is a discussion of conditions often not isolated and not demanding treatment, but nevertheless worthy of brief consideration.

POLYURIA: DIABETES INSIPIDUS

Transient polyuria is of frequent occurrence and may be due to nervous irritability or to nervous tension as seen in hysteria; in normal individuals, it may be due to some temporary nervous excitement. It may also be due to a sudden change of temperature; to the drinking of too much water, to an increased consumption of tea, coffee, or caffein; to a diuretic drug, or to intestinal indigestion. Polyuria may also be caused by fevers, by chronic hypertension, by cere-

30. Veeder, B. S., and Johnston, M. R.: The Creatinin and Creatin Content of the Blood of Children, Am. Jour. Dis. Child., August, 1916, p. 136.
31. Cutler, I. S., and Morse, Max: Studies in the Metabolism of Children, Am. Jour. Dis. Child., May, 1916, p. 326.
32. Rose, W. C., and Dimmitt, F. W.: Experimental Studies on Creatin and Creatinin, VII, The Fate of Creatin and Creatinin when Administered to Man, Jour. Biol. Chem., 1916, xxvi, 345.
33. Frothingham: Am. Jour. Med. Sc., January, 1916, p. 72.
34. Potter and Bell: Am. Jour. Med. Sc., February, 1915, p. 236.
35. Christian: Am. Jour. Med. Sc., May, 1916, p. 625.

bral injuries, by some growth or lesion in the brain, or by a pituitary disturbance.

Protracted polyuria, termed diabetes insipidus, is a peculiar condition causing the patient to pass gallons of urine per day of a specific gravity approximately that of water, namely, from 1.000 to 1.005. These patients suffer from an inordinate thirst, and unless large amounts of water are consumed, their tissues waste. They often suffer from vomiting, diarrhea or constipation, and headaches. If the patient is a child, growth is often stunted.

It was thought that the kidneys of these patients could not secrete urine of ordinary specific gravity, and hence to eliminate the solids an enormous amount of water was required. Patients apparently cured by treatment seem to disprove this hypothesis, and recently it has been shown that this condition is probably caused by a disturbance of the hypophysis cerebri. It has long been known that pathologic conditions in the brain cause polyuria. It is also known that pituitary extract stimulates the kidneys and at times acts as a diuretic, and that the posterior lobe of the hypophysis has some control over the kidney secretion. The relation between the pituitary and the kidneys has been described by Cushing in his book on the "Pituitary Body and Its Disorders." That a diminished secretion of the pituitary is a cause of diabetes insipidus seems to be borne out clinically, as some success has been reported in feeding posterior lobe extract to these patients.

At times modification of the circulation, raising the blood pressure when it is low and lowering it when it is high, will diminish polyuria. Bromids may act on the nervous system to correct polyuria; atropin has been successful at times; but in the real diabetes insipidus the most successful drug has been ergot, in fairly large doses and long continued. It is to be hoped that posterior hypophysis extract will be more successful.

In real diabetes insipidus, deprivation of water is impossible. The amount may be reduced somewhat, but the frequency with which water is needed cannot be reduced, and serious head and stomach symptoms may be the result of an attempt to limit the intake of water.

ANURIA

This condition may result from nephritis, from any serious condition of the genito-urinary tract, or reflexly in serious abdominal diseases. It may be the result of low blood pressure or of so-called hysterical conditions. Before anuria, or suppression, is diagnosed, it must be known that the bladder is empty and the ureters not obstructed.

A nephritic patient cannot live long with suppression; but in cases of nervous suppression, anuria may be a symptom for days.

If suppression is caused by uremia, the treatment is that of uremic poisoning. If there is obstruction, surgical interference of some kind is necessary. If the circulation is at fault, because of cardiac failure, digitalis and caffein may be indicated. If hemorrhage has occurred, and at times without hemorrhage having occurred, hypodermoclysis of physiologic sodium chlorid solution or a colon injection of salt solution may be given.

LOW ACIDITY OF THE URINE

This is a condition which seldom requires treatment. Urine which is neutral or close to neutral is not quite normal, except, perhaps, directly after a meal. The pelvis of the kidneys, the ureters, the bladder, and the urethra, under normal conditions, require that the urine be acid. Subacid or faintly alkaline urine has a tendency to deposit alkaline salts, to cause an increased secretion of mucus, and to irritate the bladder. Many pathogenic bacteria gain a foothold and grow in the parts bathed by this neutral or alkaline urine, which would not grow in acid urine. If there are symptoms of bladder irritability, and no other cause is ascertained than an alkaline or subacid urine, the patient should be allowed more meat unless it is otherwise contraindicated. He may also be given one of the following: dilute hydrochloric acid, hexamethylenamin or acid sodium phosphate. A gastric hyperacidity may be present, causing low acidity of the urine. This condition should be treated in the usual way by gastric sedatives and the administration of substances which inhibit acidity, such as olive oil, butter and atropin.

When on account of hyperacidity of the urine, or on account of acute irritation of the bladder or urethra, it is advisable to render the urine alkaline for a time, alkaline treatment should not be too long continued, as an alkaline urine may allow phosphate deposits on uric acid calculi, or decomposition and formation of ammonia in an already irritated bladder. The seriousness of chronic cystitis is, of course, recognized.

PHOSPHATURIA

If the urine is alkaline there may be a more or less constant phosphaturia, sometimes causing the passage of milky urine with a pinkish deposit more or less admixed with mucus on standing. Phosphaturia occurs in many nervous conditions, both organic and inorganic, at times, even in insomnia. In these cases all nervous excitement and mental irritation should be prevented, and sexual indulgence prohibited for a time.

The phosphates of these salts come mainly from the food, but are also derived from the breaking down of nucleic acid and proteins of the tissues. The phosphates are therefore increased in wasting diseases and in some forms of leukemia, but may be diminished in pregnancy when needed for the bones of the fetus.

A prolonged phosphaturia is a drain on the system, and there is always danger of causing deposits in the bladder, causing cystitis to develop. The same treatment should be given in phosphaturia as that suggested for diminished acidity of the urine, combined with any treatment required by the general condition of the patient.

(*To be continued*)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

PERTUSSIS BACILLUS VACCINE (See N. N. R., 1916, p. 321).

H. K. Mulford Company, Philadelphia.

Pertussis Bacterin-Mulford.—Marketed in boxes of 4 syringes containing 50, 100, 200 and 400 million killed Bordet-Gengou bacilli.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 16, 1916

THE LAST SIGNIFICANT FIGURE

In a delightful essay on "The Points of a Good Job," Richard C. Cabot[1] has intimated that we want some monotony, because monotony supplies the relief from the immense strain and cost of fresh thinking. It may be, as he suggests, that we should revolt and destroy any undertaking which is not somewhat monotonous. Nevertheless the habitual elements in us sometimes go to the very limit of expression. In one respect, doubtless among countless others if the truth were known, the dictates of custom have long been overworked in scientific literature: i. e., the publication of data in the form of a wealth of figures which cannot possibly have any serious significance if we overcome the inertia of habit and take the initiative of interpreting them.

The Journal is no exception to the numerous periodicals and books which are wasting printers' ink, space, several people's time, and the reader's energy in presenting results expressed in more decimal places than are justified by the conditions involved. It might even be argued by a hyperethical person that all such publications are guilty of moral delinquency in creating a false impression of the accuracy of experimental results. When we stop to consider seriously what is involved in stating, for example, that the diet furnished 2,763.6 calories (when at best a large element of guesswork is involved in the calculation as well as the analyses on which it was based); or that the urine contained 16.8347 per cent. of nitrogen (although an error of only ten minutes in the collection of the day's sample would affect the last four of these figures even if ideally perfect analytic procedures were employed); or that the blood contains 0.1234 gm. of sugar per hundred c.c. (despite the errors of the methods of measurement, etc.), or when the weight of moist feces is expressed to two decimal places, as we recently observed in a manuscript, despite the obvious impossibility of a quantitative defecation, are we not ready to institute a much needed reform?

Gephart, Du Bois and Lusk[2] have lately reminded workers in scientific laboratories that it is extremely desirable to get along with the smallest number of digits which will do justice to the experiment and yet allow other investigators to recalculate the work. As the result of a critical consideration of the number of places of significant figures in the data of metabolism experiments, they have evolved a series of rules for metabolism work, in which the analytic error is seldom much less than 1 per cent. This applies quite as well to most of the figures which need to appear on the pages of a medical journal.

Here are the conclusions to which we heartily subscribe and which are earnestly recommended to every reader who engages in the preparation of scientific manuscripts:

> A variation of 1 per cent. in the result of an experiment would not change its significance or affect its interpretation. For these reasons, it seems unnecessary to publish more than three significant figures in the tables of data, and in some cases it is not worth while to publish more than two. In order to avoid the accumulated rejection error, it is advisable to retain four figures wherever possible in the calculations, and reject the fourth digit only in the final result.

1. Cabot, R. C.: What Men Live By, Boston, 1914, p. 30.
2. Gephart, F. C.; Du Bois, E. F., and Lusk, Graham: Clinical Calorimetry, xviii, The Number of Places of Significant Figures in the Data of Metabolism Experiments, Jour. Biol. Chem., 1916, xxvii, 217.

INSTINCT, DIET, AND DEFICIENCY DISEASES

The statement is sometimes made by physiologists that the instinct furnishes the best guide to an adequate ration. The experience of diverse species is cited as an illustration of what is believed to be some fundamental principle. How erroneous this may be has lately been pointed out by McCollum[1] and his collaborators at the University of Wisconsin. A group of animals which have shown themselves singularly suited to the study of problems in nutrition were offered an exceptionally liberal variety of vegetable foods. They thus had the opportunity to select a varied and well appointed ration from the following plant products always offered to them: corn, wheat, oats, barley or rye kernel, polished rice, peas, beans, cottonseed meal, cottonseed flour, alfalfa, corn germ, wheat germ, flaxseed oil meal, peanuts, onions, cabbage, corn gluten, or wheat gluten. The result of this experiment was a failure to obtain adequate nutrition.

It may be supposed that something is lacking, in the collection of foods enumerated, for perfect nutrition, despite the apparent variety of materials. This is, however, not the case; for when comparable animals were subjected to a restricted dietary regimen of suitable proportions of the ground corn, alfalfa flour, and peas, they thrived and reared a second and a third generation on the same ration. Appetite thus fails to be a perpetually safe guide to nutrition.

Much is said, particularly in the recent discussions about the so-called deficiency diseases, concerning the importance of great variety in diet to insure the presence of every essential nutritive ingredient. The work

1. McCollum, E. V.: Simmonds, N., and Pitz, W.: The Vegetarian Diet in the Light of Our Present Knowledge of Nutrition, Am. Jour. Physiol., 1916, xli, 333.

of scientific students of nutrition is making it more evident, however, that when once the indispensable factors are recognized they can be obtained in suitable quality and quantity from a few products. Simplicity in diet will not be found incompatible with health when the dietary laws are once firmly established. Failures hitherto have been due to ignorance rather than to the paucity of the dietary essentials in common foods. McCollum points out that the practically complete success in the nutrition of rats with strictly vegetarian diets made up of but three natural foodstuffs, and the failure attending the employment of a wider variety in the food mixture, emphasizes the fallacy of the assumption that the safest plan, to insure perfect nutrition, is to include a wide variety in the selection of the constituents of the diet. So long as definite knowledge is wanting concerning the specific nutritive properties of the constituents of the diet, variety will unquestionably make for safety, but will not by any means assure safety, and, indeed, can scarcely secure the optimum result in any considerable percentage of cases. As soon as we possess an adequate knowledge of the specific properties of our natural foodstuffs and their supplementary relations to each other, it will certainly be possible to compound fairly simple and even monotonous diets which can be depended on to induce physiologic well-being closely approximating the optimum.

Although it now is certain, from the observations of the Wisconsin school, that all of the components of a successful diet are present in foods of plant origin, the satisfactory enforcement of a purely vegetarian diet in man calls for a degree of knowledge not widespread among propagandists for onesided dietaries. Fortunately milk, eggs and butter, with their incomparable nutrient virtues, are commonly admitted to the vegetarian regimen. McCollum remarks that the conscientious adherence to a vegetarian diet by one who has no adequate technical knowledge regarding the subject of diet appears to be fraught with danger since among the foods of vegetable origin, ordinarily consumed by human beings, several dietary factors are as a rule of an unsatisfactory chemical character.

An adequate diet calls for sufficient energy in the form of food. In the light of present-day knowledge the latter must furnish sufficient protein of suitable quality as well as quantity, adequate inorganic ingredients in proper proportions, and a supply of vitamins, food hormones, or whatever it may be proposed to term these indispensable accessory substances. In the recent discussions of the etiology of pellagra much has been said about the "lack of vitamins" in the diet of pellagrins. McCollum believes that there has been too much emphasis placed on the importance of the "as yet unidentified chemical factors lumped together as vitamins." So far as the evidence is available, is it not quite as reasonable to assume that there is some maladjustment of better recognized constituents of the diet in some of the "deficiency diseases," and that the vitamin problem is by no means the paramount one?

DISSOCIATED JAUNDICE

The growing tendency to examine the blood for diagnostic purposes on occasions when it was formerly customary to resort to urinary analyses alone has shown certain advantages belonging to the newer technic. Not only do the proportions of certain constituents, such as the various types of nonprotein nitrogenous compounds — urea, uric acid, creatin and creatinin — give clues to the possibility of either metabolic or renal upsets; occasionally the undue accumulation of a substance like sugar in the blood will reveal an incipient disorder before the excess of carbohydrate finds its way through the kidney filter and manifests itself in a urinary test. Thus a pathognomonic hyperglycemia may be discovered in the absence of a detectable glycosuria.

Hitherto it has been the custom of exceedingly few clinical observers to examine the blood for evidences of the presence of bile salts and bile pigments. What the superficial examination of the skin or sclera failed to disclose was left to a more painstaking test of the urine for biliary products to reveal. Examinations of this sort rarely go beyond that at present. It is becoming more and more evident, however, that without an examination of the plasma one is never justified in assuming that biliary constituents have not been retained in the blood.

Bilirubin and bile salts may both be present in very marked concentration in the plasma, and neither pigment nor salts appear in the urine. This fact has been substantiated by the recent observations of Hoover and Blankenhorn[1] of Cleveland. In the first place they emphasize that the adsorptive property of plasma for bile salts as well as bile pigments has hitherto not been clearly perceived. According to their observations the plasma may under some conditions, not yet well understood, retain a large amount of bile pigment and yield none of it to the kidney, although the kidney function may be perfectly normal. This adsorptive property of the plasma may hold bile pigment so firmly in its grasp that no pigment will be yielded to the tissues; so the disparity between icterus of the plasma and icterus of the skin may in some few instances be as striking as the disparity between cholemia and choluria. Adsorption of bile salts is not nearly so marked as adsorption of bile pigment, but in primary anemia, particularly, the presence of bile salts in the plasma without the presence of bile salts in the urine has been abundantly confirmed in the experience of Hoover and Blankenhorn.

1. Hoover, C. F., and Blankenhorn, M. A.: Dissociated Jaundice, Arch. Int. Med., September, 1916, p. 289.

There may be pronounced cholemia without choluria and also without icterus of the tissues.

The recognition of these possibilities directs consideration to the subject of "dissociated jaundice" which has formed a topic for discussion in the French clinical literature of recent years.[2] This postulates that the bile pigments and salts may reach the circulation independently of each other. So long as no attention was paid to a careful study of the biliary products in the plasma, there was no guarantee that the apparently separate appearance of either pigments or salts in the urine was not due to some "dissociation" brought by the renal filter rather than by the liver. Thus it is quite conceivable that the kidneys may at times allow the passage of the bile salts while the pigments cannot penetrate them. A true cholemia would thus fail to be accompanied by the appearance of a supposedly diagnostic sign, bile pigment, in the urine. It would not be an instance of true dissociated jaundice of hepatic origin, but merely a separation of two biliary products by renal elimination of bile salts.

Hoover and Blankenhorn insist that when bile salts without bile pigment are found in the plasma, we are bound by our present knowledge to assume there exists a genuine dissociated jaundice of hepatic origin, for thus far there is no clinical or experimental evidence to show there can be an extrahepatic origin of bile salts. In all their experimental and clinical studies they find no evidence that bile pigment can be eliminated through the kidney and bile salts retained in the plasma. If the two biliary elements are separated by renal elimination, it will always be bile pigment which will be retained in the plasma and not bile salts. The Cleveland clinicians have found true dissociated jaundice of hepatic origin in two cases of primary anemia and in two cases of lead poisoning. In the four cases bile salts were found in the blood in large amounts, that is, quite as pronounced as in complete jaundice of marked severity.

Excepting in jaundice of hemolytic origin and in complete jaundice which has undergone renal dissociation, bile pigment was not found without bile salts in the plasma. A few years ago it would have been decided unorthodox to expect bile pigment in either plasma or urine without some liver complication to occasion the perversion. It will become necessary, judging by the present outlook, to abandon the doctrine that there can be no jaundice without the agency of the liver. The investigations of Whipple and his collaborators have furnished such convincing evidences of extrahepatic jaundice that the possibility of its occurrence can no longer be neglected. Hoover and Blankenhorn are ready with a modified nomenclature for the future. To avoid confusion, they remark, in using the term "dissociation icterus" it will be advisable to employ a terminology which will indicate the source of the dissociation of biliary elements in the plasma. "Complete icterus" will mean the presence of bile pigment and bile salts in the blood. "Hemolytic icterus" implies the presence of bilirubin in the blood without bile salts, when bilirubin is formed extrahepatically. "Hepatic dissociation icterus" implies the presence of bilirubin or bile salts separately shunted into the blood stream. By "renal dissociation icterus" is meant the presence of bile pigment in the plasma due to separation of the biliary elements through renal filtration of the bile salts.

2. For a bibliography of the subject see Lemièrre, Brulé and Garban: Les rétentions biliaires par lésion de la cellule hépatique, Semaine méd., 1914, xxxiv, 301.

Current Comment

MEDICAL PROGRESS IN THE NAVY

The year ending June 30, 1916, has been a notable one in naval affairs, marking the largest expansion in times of peace in the history of the navy, according to the report of the secretary of the navy just issued. The naval appropriation act, framed during this period but not approved until Aug. 29, 1916, appropriated $313,384,212 for 1917, more than twice as much as any previous naval appropriation. Naturally, the section in the report in which physicians are most interested is that on health and sanitation. Much credit is due to the medical department of the navy for the maintenance of high standards, as is evidenced by the report. The death rate during the year was 4.48 per thousand. Fifty-one deaths (or one sixth of the entire number) were due to drowning; of these, twenty-one were caused by the sinking of the submarine *F-4*. The other predominant causes of death were tuberculosis and pneumonia. The medical officers of the navy have also carried on a large amount of work in Haiti and Santo Domingo. Acting in unison with a commission of Haitian physicians, the existing public health laws have been revised and sanitary conditions greatly improved. The naval act increased the medical corps from 347 officers and 1,500 men to 600 officers and 3,000 men, and increased the total appropriation for the medical department from $682,000 to $1,187,728. It also authorized the construction of a model hospital ship, which promises to be a marked advance on anything now afloat. The two professional training schools for the hospital corps, one on the Atlantic at Newport and one on the Pacific at San Francisco, have been making satisfactory progress. Schools for training native women in nursing have been established in Samoa and Guam. Homes for nurses at Mare Island and Boston have been provided, and provisions have been made on the coast line south of Norfolk and Mare Island, which is as yet unprovided with navy hospitals, for calling into being mobile Red Cross hospitals of 250 beds each. The correspondence school for the medical reserve corps has been initiated. While not directly connected with medicine, all will be interested in the recommendations of Secretary Daniels regarding oil conservation. When the three year construction program authorized by Congress is completed, the navy will require 6,721,000 barrels of fuel oil annually

during times of peace and about three times that amount in time of war. All of the new ships are oil burners. Before definitely entering on the construction of oil-burning battleships, the Navy Department, in 1913, asked the Department of the Interior for information regarding the probable fuel oil situation twenty years hence. The Department of the Interior replied that the land reserved by the government would probably supply a sufficient amount of fuel oil for a period greater than the life of any battleship to be constructed during the next decade. Mr. Daniels recommends the conservation of all oil reserve lands already set aside, and the finding and setting aside of other oil-bearing reserves.

ANOTHER "CONTEMPTUOUS VERDICT"

For many months the New York *Tribune* has been conducting a magnificent campaign for honesty in advertising. It has fearlessly exposed misrepresentation in advertising and has condemned, in no uncertain words, fraudulent and deceptive methods of business dealing. This has been done through a series of articles written by Samuel Hopkins Adams, the author of the well-known series on fakes and swindles in the "patent medicine" business — the "Great American Fraud." In connection with this work the *Tribune* has maintained a "Bureau of Investigations" that has done a wide public service under the efficient direction of Miss Anne L. Pierce, who was for many years assistant to Dr. Harvey W. Wiley. In the course of its campaign the *Tribune* found it necessary in the public interest to expose the methods of a rug dealer, and took occasion to refer to this man as a "dealer in rugs, furniture, fakes, frauds and swindles in a large and commodious pitfall" on Fifth Avenue. The rug dealer sued the *Tribune* for libel, asking $50,000 damages. The trial lasted two weeks and the jury brought in a verdict of 6 cents for the plaintiff. This, under the New York law, means that the *Tribune* will have to pay a total of twelve cents, the judgment plus costs to an equal amount! One of the attorneys for the *Tribune* declared that a verdict such as this "indicated that while every detail of the libelous part of the article complained of was not proved to be literally true, the essential substance of the defamatory charges was proved." He said further that it "was known in the parlance of the courts as a 'contemptuous verdict.'" This is the first of a number of actions pending against the *Tribune* and based on grounds similar to those taken in the suit just ended. It is said that the aggregate demands for damages amounts to more than a million dollars. It will not be surprising if many of these suits never come to trial, in view of the verdict just given. The *Tribune's* case is of interest to physicians because of the recent libel suit against the American Medical Association. In the Wine of Cardui suit, it will be remembered, the concern considered it had been injured to the extent of $100,000; the jury awarded it 1 cent! In the *Tribune's* case the plaintiff asked for $50,000; the jury gave him 6 cents! Question: If a 6 cent award in a $50,000 case constitutes a "contemptuous verdict," what kind of a verdict is a 1 cent award in a $100,000 case?

A NATIONAL LEPROSARIUM

The bill providing for the national control of leprosy by the United States Public Health Service has already been discussed in THE JOURNAL.[1] It provides for an appropriation of $250,000 for a national leprosarium, passed the lower house, and was on the Senate calendar when Congress adjourned last summer. It is now before the Senate for action.[2] There are few diseases that create the horror and consternation in the public mind that leprosy arouses. Yet it is of a mildly contagious nature and, in this country, is a small factor; it is estimated that there are only about 1,000 cases in the entire country. With the exception of three states which maintain permanent leprosariums, the number of leprosy patients in any state is too small to justify the erection and maintenance of state hospitals. Most of the difficulties connected with the care of leprosy have been due to disputes regarding the jurisdiction and responsibility of different states or to questions arising from the interstate transportation of lepers. The problem is a national one. While the exact method of transmission of leprosy has not yet been determined, practical experience shows that segregation is the most effective method of controlling the disease. A national hospital for lepers would make the control of this disease possible, and will solve a problem which has been most perplexing. The expenditure involved is small. It is better to appropriate $250,000 now and to bring the disease under control than to allow leprosy to develop for ten years more, when an appropriation of three or four times as much may be necessary. It is hoped that the Senate will act on this measure without delay, and that physicians and other scientific men throughout the country will urge on their senators the importance of the adoption of this bill.

WATER ABSORPTION CAPACITY OF BRAIN TISSUE IN DELIRIUM TREMENS

The water absorption capacity of the brain, as shown by Nuzum and Le Count,[3] is high in the brain of persons dying from conditions of cerebral asphyxia, particularly those associated with acidosis. One such condition with a high water absorption capacity of the brain is delirium tremens. It is to be hoped that Drs. Nuzum and Le Count will complete these interesting experiments by a determination of the absolute water content of the brain tissue in a few typical cases, including the necessary controls. Their results afford some confirmation of Martin H. Fischer's views as to the causation of edema. Fischer, it will be remembered, starts from a consideration of the conduct of organic gels, notably fibrin and gelatin, in the presence of acid. These substances, when exposed to acid solutions of suitable concentration, imbibe water to an amount much in excess of the quantity which they are able to absorb of pure water or neutral solutions. By

1. A National Leprosarium, Current Comment, THE JOURNAL A. M. A., March 4, 1916, p. 746. General News, Jan. 22, 1916, p. 287; May 13, 1916, p. 1560; June 10, 1916, p. 1685.
2. Congressional Grist, General News, THE JOURNAL A. M. A., this issue, p. 1858.
3. Nuzum, Frank, and Le Count, E. R.: The Ability of Brain Tissue to Take Up Water in Delirium Tremens and Other Conditions, THE JOURNAL A. M. A., this issue, p. 1822.

exposing various organs of different animals to conditions in which local asphyxia, and therefore local acidosis, is produced, Fischer succeeded in demonstrating that edema of the organ resulted.[4] Fischer has also shown that the addition to these acid solutions of certain substances, particularly neutral electrolytes and glucose, will diminish the imbibition of water, and will cause the partial dehydration of the gel which has already become "edematous." From this he derives indications for the treament of edema, namely, the intravenous administration of such hypertonic solutions of these neutral or alkaline electrolytes as are tolerated by the organism, and, in certain cases, of glucose. Fischer's work appears to have been the inspiration of that of Hogan,[5] whose article, by the way, is also complementary to the paper by Nuzum and Le Count. In the treatment of delirium tremens, Dr. Hogan employs intravenous administration of alkaline salt solutions and glucose. For the use of the last named substance there is a double indication. Not only does it share with electrolytes the property of dehydrating the tissues, but it has the additional function of counteracting a starvation acidosis. His solution contains, among other ingredients, sodium bicarbonate, and he sterilizes by boiling, whereby the bicarbonate is decomposed, more or less, with the formation of carbonate. The liquid injected must, therefore, be distinctly alkaline. As fear has been expressed by some therapeutists that injection of boiled solutions of sodium bicarbonate might cause gelation of the plasma, it is interesting to note that this objection seems to be ruled out by Dr. Hogan's results.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

State Board Election.—The annual meeting of the state board of health was held in Little Rock, November 18. Dr. Joseph T. Clegg, Siloam Springs, was elected president; Dr. Burrell A. Fletcher, McClelland, vice president, and Dr. Charles W. Garrison, secretary and state health officer.

Hospital News.—At the meeting of the staff of the Michael Meagher Memorial Hospital, Texarkana, November 2, Dr. Jean A. Lightfoot was elected president of the staff; Dr. Robert L. Grant, vice president; Dr. Benjamin F. Dixon, secretary, and Sister Raphael, treasurer and superintendent of the hospital.

DISTRICT OF COLUMBIA

Prevention of Venereal Diseases.—The Commissioners of the District have asked Congress to provide an appropriation whereby the Health Department can make free laboratory examinations for physicians for the diagnosis of syphilis and gonorrhea and maintain a venereal clinic.

Freedmen's Hospital Work and Needs.—The annual report of Dr. W. A. Warfield, surgeon in chief of Freedmen's Hospital, which has just been made public, shows that during the fiscal year 1916 the institution had 3,671 indoor patients, as compared with 3,535 during the preceding year. Dr. Warfield calls attention to the need for a pathologic building and to the lack of suitable quarters for laboratory study, and asks that wards be provided for eye cases and for diseases of the nervous system. He recommends an increase in the force of employees and larger salaries for the employees in the lower grades, the latter recommendation being supported by a plea for more competent workers in the minor positions and less frequent changing of workers than obtains under existing conditions.

ILLINOIS

Personal.—Dr. John H. Rice, Quincy, was operated on for the removal of gallstones, November 27.——Dr. Edgar A. Green, Ridgeway, has been appointed local examining physician by the Illinois Service Commission.

Diphtheria.—At Hoopeston, Vermilion County, November 17, twenty-four cases of diphtheria were reported to the state board of health in twenty-four hours and the state epidemiologist and laboratory assistant were sent to Hoopeston to study the epidemic.

Chicago

New Infirmary Building.—Plans for a new infirmary, to cost $500,000 and to be an integral part of the Municipal Tuberculosis Sanatorium, have been completed by the architect, Mr. Jarvis Hunt, and are under the direction of Dr. Albert J. Ochsner. The infirmary will have a large roof garden; kitchen and dining rooms will be on the top floor; on three sides there will be direct sunlight; at the south end of each floor will be a large sun parlor, and there will be an English basement for the provision of light occupation for patients. The building is intended to handle only such patients as are too ill for cottage treatment.

Personal.—Dr. E. Wyllys Andrews has been appointed chief of staff of the Mercy Hospital and head of the Department of Surgery of the Northwestern University Medical School.——Dr. J. Elliott Royer has been elected professor of neurology in the College of Medicine of the University of Illinois.——Drs. Bertram W. Sippy, Asher F. Sippy, Fred Drennan and Gatewood were injured in a collision between the automobile in which they were riding and an automobile truck, December 19. Dr. Bertram Sippy sustained severe bruises and Dr. Asher F. Sippy a fractured rib and bruises.——Dr. Gottlieb A. Lurie has been appointed by the state board of health district health officer for the southern district of Illinois, with headquarters at Mount Vernon.

IOWA

The Typhus Situation.—Another case of typhus has been discovered at Fort Madison. All patients with the disease previously reported are in good condition, and the threatened epidemic is well in hand.

Personal.—Dr. Henry J. Piper, Randolph, was struck by an automobile, November 29, fracturing his right leg below the knee.——Dr. Warren B. Klinetop, Charles City, was severely injured by the collapse of a scaffolding, November 30.

MARYLAND

Personal.—Dr. William H. Park, director of the bureau of laboratories, New York City Health Department, spoke at a recent public health meeting in Baltimore, held at the Johns Hopkins University, on "The Dangers from Impure Milk and the Importance of Milk as a Food."——Dr. John D. Blake, commissioner of health of Baltimore, is ill at his home from overwork.

Meetings.—At the annual meeting of the Baltimore City Medical Society, held at the Medical and Chirurgical Faculty building, Dr. Thomas S. Cullen was elected president; Dr. William T. Watson, vice president; Dr. Emil Novak, secretary, and Dr. William S. Gardner, treasurer. Dr. Joseph C. Bloodgood addressed the annual meeting, his topic being "Recent Observations on Bone Tumors."

Hospitals Form Union.—An organization of most of the hospitals in Baltimore to protect themselves against the high cost of living, and to accomplish reforms that they could not accomplish singly, was created at a meeting of representatives of seven hospitals held at the Mercy Hospital during the past week. It was called The Hospital Conference

4. Fischer, M. H.: Contribution to Colloid-Chemical Analysis of Absorption and Secretion, Lancet-Clinic, June 22 and 29, 1912; A Further Response to Some Criticisms of the Colloid-Chemical Theory of Water Absorption by Protoplasm, THE JOURNAL A. M. A., Oct. 19, 1912, p. 1429; Nature, Cause and Relief of Nephritis, New Jersey Med. Soc. Jour., March, 1914; Relation Between Chlorid Retention, Edema and Acidosis, THE JOURNAL A. M. A., Jan. 23, 1915, p. 325; Classification, Prognosis and Treatment in the Nephritides, abstr., ibid., July 29, 1916, p. 391.

5. Hogan, J. J.: Treatment of Acute Alcoholic Delirium, THE JOURNAL A. M. A., this issue, p. 1826.

Association of Maryland. The following hospitals were represented: Maryland General, University, Mercy, St. Joseph's, St. Agnes, Hebrew and the Union Protestant Infirmary. Johns Hopkins Hospital, though it is not yet officially connected with the union, was declared to be in sympathy with its principles. Its first act was to raise the fees in compensation cases—cases that are within the purview of the Workmen's Compensation Act. Its next act will be to obtain a reduction of hospital water rents, or to have hospitals, especially those having charity wards, exempted from water rents. If the plan to raise fees in compensation cases goes through, $2 a day instead of $1 for each patient will be asked. Johns Hopkins Hospital has already raised its rate for such cases to $2.50 a day. The object of the union is to bring about a closer relation and cooperation between hospitals and to take the initiative in bringing about consistent legislation affecting the interests of hospitals throughout the state. There was no discussion of a united effort to increase the fees required from private patients, though the Johns Hopkins, Maryland General and the Hebrew hospitals have already done so.

NEW YORK

Clinic for Infantile Paralysis.—A clinic was held in Syracuse under the supervision of the state department of health, December 15 and 16, to teach methods for the after-care of infantile paralysis. This clinic, like other similar clinics being held throughout the eastern states, was in charge of Dr. Robert W. Lovett of Harvard Medical School.

Personal.—Dr. Waldon E. Muns, formerly of Bellevue Hospital laboratory, New York, has been appointed first assistant bacteriologist in the Syracuse city laboratory, succeeding Dr. William L. Culpepper, resigned to accept a position with the International Health Board of the Rockefeller Foundation.——Dr. Bernard L. Wyatt, Trudeau Sanatorium, Saranac Lake, has resigned to accept the position of superintendent of the Fayette County, Kentucky, Tuberculosis Sanatorium. Dr. Wyatt will assume his new duties in April, and it is planned to open the sanatorium to receive patients by July 1.

New York City

Hospital Name Changed.—The Long Island State Hospital for the Insane, Brooklyn, will hereafter be known as the Brooklyn State Hospital.

Occupational Clinic.—The Municipal Civil Commission is endeavoring to enroll medical men for the occupational clinic of the health department, which is located at 49 Lafayette Street. The object of the clinic is to safeguard the city against unhealthy food handlers in restaurants or other places.

New Medical Quarterly.—The department of charities has begun the publication of a quarterly for the purpose of presenting medical articles embodying the results of the scientific work done by the various hospitals of the department. This publication is entitled the *Bulletin of the Department of Public Charities.*

Portrait Presented.—On December 4, at the convocation of the student body and faculty of Long Island Hospital, the graduating class presented to the institution a portrait of the late Dr. Joseph H. Raymond, formerly secretary of the faculty and professor of hygiene. Dr. John D. Rushmore accepted the portrait on behalf of the faculty.

Academy Election.—At the annual election of the New York Academy of Medicine, December 7, the following officers were elected: president, Dr. Walter B. James; vice president, Dr. Edwin B. Cragin; trustee, Dr. Charles L. Dana; member of committee on admissions, Dr. Samuel A. Brown, and member of committee on library, Dr. Warren Coleman.

Open Window Week.—The fresh air campaign which the health department has prosecuted so vigorously during the past week culminated on Sunday, December 10, by what has been designated as the "Finley Hike." This was an eight-mile walk from the Stadium of City College to Getty Square, Yonkers, in which representatives of various walking clubs, the students of City College, and as many of the public in general as could be persuaded to, joined the party. President Finley donated three silver and twenty-five bronze medals to be awarded to those whom the judges and scorers thought deserving. A further means of impressing on the public the value of fresh air is the attempt to organize a new "I. W. W.," that is, "I Walk to Work" club. As an inducement to join this company the health department holds out the following: "Walk a mile in the open air twice a day. It will add ten years to your life. If you do not believe it, try it and see."

NORTH CAROLINA

Hospital Notes.—Fairview Hospital has been incorporated at Newbern, with a capital stock of $5,000, by Dr. George A. Caton and others.——Dr. John W. Long, Greensboro, has begun the reconstruction of a residence in that city for a hospital.

Public Health Nursing.—The state board of health has established, through its bureau of tuberculosis, a public health service, under the charge of Miss S. H. Cabaniss. One half of the salary and the traveling expenses of the director of this service is paid by the Metropolitan Life Insurance Company.

Personal.—Surgeon Benjamin W. Brown, U. S. P. H. S., who is making an unofficial health investigation of Charlotte, gave an illustrated lecture in that city, November 9, on "The Government's Fight for Health."—Dr. David B. Sloan has been commissioned first lieutenant, N. C. N. G., succeeding Dr. John H. Pease, Canton, deceased, and has joined his command on the Southern frontier.——Senior Surgeon James B. Stoner, U. S. P. H. S., who has been stationed for the last two years at Wilmington, but has recently been on duty in New York with the force engaged in the infantile paralysis epidemic, has returned to Wilmington prior to assuming his duties as immigrant inspector at Montreal.——Dr. John C. Wessell, Wilmington, has been appointed acting assistant surgeon, U. S. P. H. S., and assigned to duty at the Marine Hospital.——Dr. Harry Q. Alexander, Matthews, has been reelected, for the ninth term, president of the State Farmers Union, and Dr. James M. Templeton, Cary, has been reelected vice president.

NORTH DAKOTA

Poliomyelitis.—The *Bulletin* of the North Dakota State Board of Health for October says that the number of cases of infantile paralysis in the state had reached seventeen, six of which proved fatal. The cases were distributed by counties as follows: Bottineau, 3; Cass, 4, with 2 deaths; Stutsman, 1, with 1 death; Sargeant, 1; Cavalier, 3; Grand Forks, 2; Kidder, 1, with 1 death; Divide, 1, with 1 death, and Golden Valley, 1, with 1 death.

Kotana Association Organized.—Physicians of northwestern North Dakota and northeastern Montana, at a meeting held in Williston, N. D., November 27, effected the organization of the Kotana Medical Association, whose territory includes the counties of Williams, McKenzie, Divide and the west half of Mountrail and Drake, in North Dakota, and Sheridan and Richland counties in Montana. The following officers were elected: president, Dr. Carlos S. Jones; vice president, Dr. Hilmar T. Skovholt, and secretary, Dr. Thomas J. Strong, all of Williston.

PENNSYLVANIA

Academy Buys Property.—The Pittsburgh Academy of Medicine has purchased, for $25,000, the property of the Bellefield Club on Craig Street, 50 by 140 feet, improved with a two story brick building.

Personal.—Dr. David R. Morgan, Edwardsville, has sailed for France, where he will begin work as superintendent of Army Hospital No. 10, Paris.——Dr. William S. O'Neill Sherman has returned to Pittsburgh after a study of European war conditions.——A complimentary banquet was tendered by the McKane County Medical Society to its president, Maj. William C. Hogen, M. C., Pa. N. G., who will soon return to his duties as chief medical officer of the Sixteenth Pennsylvania Infantry, at Camp Stewart, El Paso, Texas.——Dr. T. Lyle Hazlett, Pittsburgh, chief surgeon of a Red Cross hospital in Persia, has returned on furlough after nearly two years in the Russian service.——Dr. William H. Howell, Altoona, fell while entering the Altoona Hospital, November 17, fracturing a bone in his elbow and spraining his left foot.——Lieut.-Com. Wesley H. Rennie, U. S. N., has resigned, and will practice in Chester.——Dr. Horace R. Smith, Altoona, underwent an operation at the Altoona Hospital, November 15, for the amputation of three fingers of the left hand on account of Roentgen-ray burns.

Philadelphia

Colver Foundation Lectures.—Dr. William W. Keen of the class of 1859 of Brown University, Providence, R. I., will deliver a series of three lectures under the Colver Foundation at that university, beginning January 10, where his subject will be "Medical Research and Human Welfare."

Crippled Children's Home Opened.—The St. Edmund's Home for Crippled Children, the first Catholic institution of its kind in the country, was dedicated, December 8, by Archbishop Pendergrast. The building is a four-story structure containing a chapel, dormitories, dining room, class rooms, recreation halls and an infirmary; it has a capacity for sixty children.

Personal.—The house of Dr. John K. Knorr was ransacked by burglars, December 1, who secured more than $1,000 worth of valuables.——Dr. and Mrs. John W. Millick were severely injured by the overturning of their automobile between Holmesburg and Bustleton, November 26.——Dr. William H. Jeffreys, formerly a missionary in China, has been chosen superintendent of the City Mission of the Protestant Episcopal Church in old St. Paul's Church.——Dr. Elwood R. Kirby has been appointed chief surgeon of the genito-urinary department of the Philadelphia General Hospital.

Tuberculosis Week.—The National Medical Examination Day, set for December 6, in observation of tuberculosis week, was inaugurated in Philadelphia by the introduction of medical examination of employees in six of the city's large department stores and all the industrial concerns in the city, involving more than 70,000 employees. Although the factories have been under scientific management for some time, the introduction of medical examination of every employee once a year has caused production to be increased 42 per cent., while the cost of production has decreased 10 per cent. The committee carrying on the campaign of Tuberculosis Week includes Drs. Charles J. Hatfield, Joseph F. Neff, former director of the department of health and charities; Walter S. Cornell, chief of the department of school and medical inspection, and Charles S. Miller of the department of health.

Improvements at Philadelphia Hospital.—For the first time in its history, the Philadelphia Hospital (Blockley) has a diet kitchen, and the nurses of the institution are being given a course in dietetics by a trained dietitian. A porch has been built for tuberculous patients, where 150 patients can be accommodated. The women's Tuberculosis Ward has been wired for electricity and the historic rats have been abolished. The women's advisory board has decided to concentrate its efforts for the next year to the extension of the social service system, and asks for enough social service workers to protect the community from the discharged patients; to follow up the cases and see that the children left uncared for are placed in suitable homes, and that feebleminded boys and girls, after leaving the institution, are put into the proper institutions. They are also asking for a home for nurses so that three nurses will not have to occupy one small room, as they do at present.

WYOMING

State Board Meeting.—At a meeting of the state board of health, held in Cheyenne, November 17, the general conditions for sanitation and good health of the state were discussed, and preliminary steps were taken toward a joint meeting with the State Board of Medical Examiners, to consider joint topics of interest.

Society News.—Physicians of Natrona County met in Casper, October 19, and organized a county medical society, electing the following temporary officers: Dr. Joseph F. O'Donnell, president; Dr. Marshall C. Keith, vice president, and Dr. Foster, secretary. At the first regular meeting of the society, November 18, the temporary officers were elected to permanent positions.——The Northwestern Wyoming Medical Society, at its meeting held in Cody, elected Dr. Herbert T. Harris, Basin, president; Dr. Delmah S. Hamilton, Greybull, vice president, and Dr. Jesse D. Lewellen, Powell, secretary-treasurer.

CANADA

New Graduates.—Forty-seven have recently passed the final examinations of the Faculty of Medicine, University of Toronto. All of them have enlisted for service in the medical corps, and will leave in the immediate future for overseas service. Four have already seen service.——A special convocation was held on the evening of November 28 in Grant Hall, Queen's University, Kingston, Ont., at which sixty-three medical graduates were granted their degrees. All these graduates will go overseas shortly to serve at the front.

Tuberculosis Among Canadian Troops.—A conference of experts in tuberculosis has been arranged to meet in Ottawa, to advise the Dominion of Canada Hospital Commission regarding the location of sanatoriums; the most recent methods of treatment, diet and exercise; the maximum and minimum capacities of sanatoriums, and other questions regarding tuberculosis among the Canadian troops. There are already 370 Canadian soldiers suffering from tuberculosis in the sanatoriums of the various provinces, of whom 175, or nearly 50 per cent., have been overseas, and about thirty soldiers a month are being returned to Canada from abroad suffering with the disease. The members of the conference are Dr. Alfred Thompson, M. P., Dawson, Yukon, president, and Drs. Edward R. Baldwin, Saranac Lake, N. Y.; Charles D. Parfitt, Gravenhurst, Ont.; Jabez H. Elliott, Toronto, and John R. Byers, St. Agathe-des-Monts, Quebec.

Personal.—Capt. W. J. Kirby, A. M. C., has been transferred from Training Depot No. 1 to that of Medical Officer 198th Battalion for overseas service.——Capt. Kent Manning, A. M. C., is to be Medical Officer of the 205th Overseas Battalion.——Col. A. E. Ross, M. P. P., C. M. G., with the 1st Canadian Division as A. D. M. S., will remain at his post of duty. He has recently been acting on a special board appointed to inquire into Canadian hospital conditions in England.——Lieut. Francis Carl Howard, Toronto, a student in medicine at the University of Toronto, died in Frankfort, Germany, the same day that he was wounded and captured, September 9.——Capt. Victor Moorhouse, M.D., Toronto, son of Dr. H. H. Moorhouse, and brother of Dr. Walter Moorhouse, commander of a machine gun battery at the front, has been awarded the Military Cross for gallantry. He is a graduate of the class of 1912, University of Toronto. ——Lieut.-Col. Ethelbert B. Hardy, A. M. C., Toronto, has been awarded the D. S. O.——Dr. John A. McCollum, Toronto, has been accepted for overseas service.——Dr. Walter B. Seaton, R. A. M. C., Fort Erie, Ont., has returned on furlough from the Western Front.——Capt. Henry H. Argue, formerly assistant superintendent of the Toronto General Hospital, has been awarded the Military Cross for conspicuous bravery in action.——Capt. Arthur J. Ireland, who went overseas with the C. A. M. C., was transferred to the R. A. M. C., and sent to France, where he has recently been specially mentioned in despatches.

GENERAL

Naval Training Schools Enlarged.—On account of the increase in the Hospital Corps of the Navy, authorized by the Naval Appropriation Act, the training schools for hospital corps men at Newport and San Francisco will be enlarged.

To Study Infantile Paralysis.—Dr. A. M. Stimson, assistant director of the Hygienic Laboratory, has been assigned by the U. S. Public Health Service to collaborate with the bacteriologists at Rochester, Minn., in the study of the bacteriology of poliomyelitis.

Compulsory Health Insurance Opposed by Labor.—At the conference on social insurance, in Washington, D. C., December 5-9, Samuel Gompers, president of the American Federation of Labor, protested in no uncertain terms against the enactment of legislation providing for compulsory health insurance. Mr. Gompers argued that compulsory social insurance would tend to make class distinctions rigid; and that it would not reduce poverty, because the relief afforded by it would be merely temporary. Organized labor, he said, would not give its consent to any effort to compel those in industrial activities to take out health and accident insurance policies.

Congressional Grist.—The second session of the Sixty-Fourth Congress has convened with several bills of interest to the medical profession on the calendar. Bills have passed the House and are now pending in the Senate to provide for the treatment and care of persons afflicted with leprosy (H. R. 193), to create a bureau of labor safety in the Department of Labor (H. R. 153), and to amend the act incorporating the American Red Cross (H. R. 14426). A bill to provide federal aid in caring for indigent tuberculous persons (S. 5885) has been favorably reported by the committee and is now on the Senate calendar, but has passed neither House nor Senate.

Bequests and Donations.—The following bequests and donations have recently been announced:

University of Chicago, Medical Department, a donation of $200,000 by Mr. Charles H. Ruddock, New York.

New York Skin and Cancer Hospital, a gift of the property adjoining the hospital, as a memorial of his mother, by William G. Van Antwerp.

Mount Sinai Hospital, New York, $2,500; Montefiore Home and Beth Israel Hospital, each $1,000, by the will of Mrs. Emma Calman.

Mount Sinai Hospital, New York, $5,000, Montefiore Home for Chronic Invalids, Home for Aged and Infirm Hebrews, and Beth Israel Hospital Association, each $2,500, by the will of Jaques Halle.

Presbyterian Hospital, New York, $350,000, by the will of Charles W. Harkness.

Clifton Springs (N. Y.), Sanitarium, a bequest of $3,324.55; nurses' fund of the Clifton Springs Sanitarium, $1,000, by the will of Mary E. Foster.

Alabama Maternity Home, Mobile, $1,400, as a result of a canvass.

Aid to the Belgian Profession.—The report of the treasurer of the committee of American physicians for the aid of the Belgian profession, for the quarter ending Nov. 30, 1916, shows the following contributions:

Dr. Edward E. Mayer, Pittsburgh	$ 10.00
Dr. W. C. Cahall, Philadelphia (3rd contribution)	1.40
Receipts for the quarter ending November 30	$ 11.40
Previously reported receipts	7,946.86
Total receipts	$7,958.26
Previously reported disbursements:	
1,625 standard boxes of food at $2.20	$3,575.00
1,274 standard boxes of food at 2.30	2,930.20
353 standard boxes of food at 2.28	804.84
Total disbursements	$7,310.04
Balance	$648.22

F. F. Simpson, M.D., Treasurer,
5 Jenkins Arcade Bldg., Pittsburgh.

FOREIGN

Neisser's Bequest to the City of Breslau.—The late Prof. A. Neisser bequeathed his property to the city of Breslau. It is valued at 1,500,000 marks, nearly $400,000. He stipulated that his villa with its art treasures be maintained as a museum for contemporaneous art, and further, that the rooms be used in giving high grade municipal concerts and similar entertainments.

Deaths in the Profession Abroad.—H. Hochhaus, professor of internal medicine at the University of Cologne, aged 56.——H. Kurella, a neurologist of Berlin, formerly editor of the *Zentralblatt für Nervenheilkunde* and of the *Zeitschrift für Elektrotherapie*, aged 58.——F. Kleinhans, professor of obstetrics at the University of Prague.——A. von Hippel, until 1914 regular professor of ophthalmology at the University of Göttingen, author of numerous works on the eye, color blindness and school myopia, and pioneer in operative treatment of myopia and of lesions in the cornea. His seventieth birthday was celebrated two days before his death.

A New Italian Journal Devoted to the Cardiovascular System.—The *Policlinico* of Rome publishes three journals, the *Sezione pratica*, a weekly, and the *Sezione chirurgica* and the *Sezione medica*, which appear monthly. All three are indexed regularly by THE JOURNAL. A few months ago the *Policlinico* editors began to publish the monthly *Annali d'igiene*, a long established journal devoted to hygiene. Now comes the announcement of the founding of a new monthly journal, *Le malattie del cuore*, devoted exclusively to the cardiovascular system. The editor in chief is Prof. F. Mariani of Genoa, but the address of the journal is the same as of all the *Policlinico* publications, Via Sistina 14, Rome. Subscription 18 lire ($3.60). The suspension of the *Clinica medica* of Milan is announced, "for lack of material, the collaborators being all otherwise engaged at present."

Annual Meeting of the German Preventive Society.—A committee was appointed at last year's meeting to suggest ways and means to arrest the spread of venereal diseases, and their report at the recent meeting called for a complete transformation of the present system of supervision of prostitution, with penalties for those who knowingly transmit venereal diseases, special graduate courses for physicians, penalties for treatment and for offering treatment of venereal diseases by the unqualified, and the organization of a course on sexual pedagogics in colleges and universities. Hahn of Hamburg reported on the welfare work for those with venereal diseases. Consulting headquarters, he says, have been organized all over Germany by the social insurance boards, and they are proving so popular that at Hamburg the rooms and medical force already have had to be enlarged. The objection that these welfare dispensaries conflict with professional secrecy he dismisses by saying that almost any communication from the physician to the insurance authorities conflicts with the strict enforcement of professional secrecy. Another objection that has been made is that the consulting offices come between the patient and the physician, sapping the patient's confidence in his physician. In reality, he declares, it works out just the opposite. It has been found further that those with venereal disease are very glad to get advice and treatment free. Instead of driving them to quacks, the opposite effect seems to be realized. The free specialist consulting dispensaries are proving a powerful means of defending the public against quacks.

WAR NOTES

Refugee Physicians at Budapest.—The *Medizinische Klinik* relates that there has been much distress among the physicians who had to flee from Roumania when it entered the war. Many saved nothing but their lives.

Hospital Workers Sail.—Nine physicians and hospital workers sailed on the Transatlantique Line steamship *Rochambeau* to join the Harjes-Norton Section of the American Volunteer Motor Ambulance Company, in France.

Milk Supply in Berlin.—The *Deutsche medizinische Wochenschrift* mentions that whole milk can be obtained only for children under 6, the sick and the pregnant. Only families with children above this to 10 years old can obtain skimmed milk.

Physicians' Unit Organized.—At a meeting called by Dr. George Gellhorn at St. Louis, December 1, a unit of the American Physicians' Expedition was organized, and $5,125 of the $30,000 required to finance a unit of physicians and nurses was subscribed. Eight units have already been organized in the United States, namely, three in New York, two in Chicago and one each in Philadelphia, Indianapolis and Milwaukee.

BERLIN LETTER

(*Received December 13, 1916*)

BERLIN, Oct. 10, 1916.

Personals

DEATHS IN THE PROFESSION

In the five months during which my letters have not reached you, there were, of course, a large number of changes in the teaching staffs of our universities, the chief of which I will communicate to the readers of THE JOURNAL. I believe that this will be of interest, not only to German-American physicians but also to such American physicians as have personally, or in the course of their studies, been acquainted with the German universities. Noteworthy, particularly, is the large number of deaths. The rapidly succeeding deaths cause one to wonder whether the fierce fighting which is taking place in the field has not an influence on the vitality of those who remain at home, particularly as one considers the more aged. Certainly the strong psychical influence which depresses many sensitive persons in these times, and which influences their vitality, must be considered, especially in relation to the deaths of relatives who are serving for the Fatherland. After all, however, such an influence is a rather rare consideration. Nevertheless, in this time in which one is repeatedly affected by the deaths of numerous friends and relatives, and also by each noteworthy death at home, he is inclined to relate what psychologically might well be connected, these deaths with those occurring in the field. When one considers, however, that many of the university professors who died were elderly, one realizes that their deaths were natural occurrences. On May 24 the well-known anatomist and anthropologist of Strassburg, **Gustav Schwalbe,** died at the age of 74.——At the same time, the University of Strassburg lost the director of the pathologic institute, **Chiari,** aged 65.——In the battle of Verdun, **Dibbelt,** the privatdozent of Giessen, died. He had just been appointed director of the pathologic institute of the city hospital in Mainz.——Following a severe wound, **Dr. Lübe,** the professor of comparative anatomy at Königsberg, died in May, aged 46.——At the end of the same month, following infection in the course of his work, the well-known specialist of surgery of the gallbladder, **Kehr,** died in Berlin, aged 54. He had removed to Berlin from Halberstadt many years ago.——A few days before his seventieth birthday, **von Bruns,** well-known surgeon, died June 2, of pneumonia.——On July 6, we lost the noted anatomist, **Albert Fraenkel,** aged 68, for many years director of the Urban Berlin City Hospital. A few months before he had given up his position, and a severe infection of the heart prevented his carrying out his *otium cum dignitate*. He was a nephew of Ludwig Traube, and one of the older Berlin pupils of von Leyden. Of his many important studies probably the most important was the discovery of the pneumococcus. Most of his work concerned the diseases of the lungs, and he was as well informed con-

cerning the pathology of these diseases as concerning their clinical manifestations.——On August 27, the noted anthropologist of Munich, **Ranke,** died, aged 80.

About the same time, **Adolf Weil,** the discoverer of the disease which bears his name, died at the ager of 68, in Wiesbaden. Some time ago he gave up active work at the University of Dorpat because of illness and moved to Wiesbaden. His work was particularly important in relation to heart diseases.

On July 30, the University of Breslau lost one of its professors, **Albert Neisser,** probably one of the greatest dermatologists of his time. To him we owe the discovery of the cause of gonorrhea at a time in which the foundations of bacteriology had not yet been established by Robert Koch. Of the greatest importance were also his studies concerning bacteriology and relations to disease of the leprosy bacillus, as well as his bacteriologic and clinical studies concerning syphilis. One remembers particularly the trip which he made to Batavia in order to study on monkeys the infection and treatment of syphilis. He developed a bladder infection following an operation for the removal of a stone subsequent to an inflammation of the bladder. Neisser was also a widely learned man aside from his knowledge of medicine. He had especial interest in the various arts, being particularly interested in music. He attended practically every noteworthy musical entertainment in Germany, and one was accustomed to see him at every great musical entertainment not only in Berlin, but in Leipzig, Stuttgart and other places. His residence was in effect a museum, containing wonderful paintings, and special prominence was given to paintings by two artists whose work was successful only through his interest and patronage. There are also several Böcklins.

Five days before his seventieth birthday, the well-known surgeon of Jena, **B. Riedel,** died. His most important work concerned abdominal surgery. His most important literary works were his monographs on German surgery, and tumors of the throat, and the editing and revising of the second and third parts of von König's system of surgery.

September 13, **E. Richter,** professor of surgery, and editor of the *Zentralblatt für Chirurgie,* died in Breslau, aged 79. Among his most important work was his textbook on the surgery of gunshot wounds in war.

On October 3, the well-known surgeon of Heidelberg, **Czerny,** died, aged 74. He occupied most of his time as surgeon in one of the hospitals for the wounded during the first year of the war, and his observations have been published in various places. In this work with his usual freedom of speech he criticized various methods and thereby incurred the ill-will of many persons. These quarrels were, however, because of the importance of the war, very quickly discontinued. Nevertheless, they served to rather diminish the importance of Czerny's work.

APPOINTMENTS TO UNIVERSITY CHAIRS

These numerous deaths caused many vacancies in the teaching staffs of our various universities, most of which were filled by the appointment of new men. Some of the vacancies are not yet filled. Hoffmann, who held the chair of physiology in Königsberg, was appointed to the same chair in Marburg.——His privat-dozent Weiss succeeded him at Königsberg.——Lüthge of Kiel, who died of typhus, was succeeded by Schittenhelm, whose position in Königsberg was filled by Matthes of Marburg.——Matthes was succeeded by v. Bergmann, director of the department of internal medicine in the city hospital of Altona, son of the well-known surgeon of the same name.——Kirschner, a son of the chief mayor of Berlin, succeeded Friedrich, through whose death the chair in surgery at Königsberg became vacant.——The privat-dozent for children's diseases, Stolte of Berlin, was called to Breslau to succeed Tobler, whose death has been announced. ——In Königsberg also, Professor Sobotta of Würzburg was called to the professorship of anatomy.——Kleist of Erlangen has been appointed director of the clinic in psychiatry at Rostock.——The newly made *Extraordinariat* of internal medicine at this same university was filled by the appointment of Curschmann, director of the city hospital in Mainz, son of the Leipzig clinician.——Chiari was succeeded by Mönckeberg, demonstrator at the city hospital in Düsseldorf, who therefore moves to Strassburg.——The position of A. Wolff, who held the chair of dermatology at Strassburg, was filled by the privat-dozent Arndt of Berlin.——Schmidt of Giessen succeeded von Römer as director of the hygienic institute in Halle.——Kisskalt of Königsberg became ordinariat in hygiene at Kiel.——Von Wasielewski of Heidelberg was appointed director of the hygienic institute in Rostock. ——A. Baginsky has resigned as director of the Kaiser und Kaiserin Friederich Kinderkrankenhaus in Berlin. In view of the war, however, he will continue his work for the present and his successor will probably be Finkelstein.

HONORS TO NOTED PHYSICIANS

Fortunately, some of the veterans among our medical authorities survive the changed mode of life under the conditions of war, and some of them have celebrated their seventieth, and even their eightieth birthday, amid testimonials of appreciation from the medical profession and from other circles. Among them is the internist Bäumler of Freiburg, whose eightieth birthday was celebrated May 13, also Mannkopff, formerly director of the Marburg medical clinic whose eightieth birthday fell on June 5.——The Berlin ophthalmologist, Hirschberg, was made honorary member of the Berlin Medical Society on the recent fiftieth anniversary of his doctorate.——This fiftieth anniversary was celebrated also in June by Trendelenburg, formerly of Leipzig; and by Filehne the pharmacologist, formerly of Breslau.——Also in June the fiftieth professional anniversary of the bacteriologist and lung specialist, Max Wolff of Berlin, and in September, Haase, the anatomist, formerly of Breslau, was celebrated.

WALDEYER'S EIGHTIETH BIRTHDAY

October 6, the eightieth birthday of Waldeyer, was celebrated with much ceremony. In a time of peace this would certainly have been celebrated like the eightieth birthday of Virchow, with the participation of the medical profession the world around, but under prevailing conditions the celebration was restricted to German physicians. But in spite of the seriousness of our days, Waldeyer received numerous honors. Delegates from societies and universities all over Germany came to bring him their congratulations. Ministerialdirektor Kirchner presented him with a bronze portrait plaque in the name of his friends and pupils. The Leopoldinische Akademie der Wissenschaften at Halle bestowed the golden Cothenius medal on him, and he was made an honorary member of the Anthropological Association. The kaiser conferred a hereditary title of nobility on him. Although Waldeyer is still amazingly vigorous mentally, yet he intends to give up his chair at the end of next semester.

The War

RESULTS OF TREATMENT IN THE MILITARY HOSPITALS

The official figures have been published in regard to the treatment of the sick and wounded in the military hospitals of the entire home zone throughout Germany. They show that 90.2 per cent. of the men became fit for duty again; 1.4 per cent. died; 8.4 per cent. were left unfit for military service or were dismissed from the ranks. In consequence of the hygienic measures enforced, especially the protecting vaccinations, the number of cases of epidemic diseases in the armies has declined almost to the vanishing point. These have always been scattered cases and the military measures have never been disturbed by epidemics.

WAR LOSSES IN THE PROFESSION

The losses in the medical force of the German army and navy, according the first six hundred casualty lists, have been as follows: fallen, 342; died of disease, 186; severely wounded, 176; slightly wounded, 553; taken prisoner, 156; missing, 87.

Fund Collected for Physicians Serving with the Army

For some time the profession in Berlin and also at a number of other points in Germany has been collecting funds to assist, after the war, physicians who left their practice to serve with the forces. The Berlin committee has collected to date 511,002 marks, which with the interest amounts now to a total of 524,189 marks, over $131,000, which is now at the disposal of the Kuratorium.

Raising Medical Fees

Corresponding to the general increase in the cost of living, the physicians in Berlin have also raised their fees. For office consultation they now ask at least 3 marks; for a day visit at the house, at least 4 marks and 5 when the call is urgent or the summons is not made until after the close of office hours. For consultations and visits between 9 p. m. and 8 a. m. at least double the above. (A mark is about equivalent to our quarter.) For other measures called for in medical practice, there is a corresponding rise. Cash payments are required for night visits, death and other certificates. However, every physician is free to reduce these prices in exceptional cases and for the indigent.

PARIS LETTER

PARIS, Nov. 16, 1916.

The War

WOMEN WORKERS AND THE MEDICAL SERVICE

Thanks to the initiative of Dr. Sieur, director of the medical service of the military government of Paris, dispensaries for the assistance of women working in ammunition factories have been set up in eight industrial centers in and near the capital. An appropriation of 8,000 francs ($1,544) has been granted by the general council of the department of the Seine for these dispensaries. They are open every evening, this being the most convenient time for the patients to absent themselves from their work. A thorough system of records furnishes valuable data as to the influence of the work on the physiology of the women. The medical staff of the dispensaries is also charged with the duty of inspecting the hygienic condition of the work shops.

FOUNDATION OF A CENTRAL LIBRARY FOR THE MEDICAL SERVICE OF THE ARMY

To bring together all the documentary evidence likely to serve in the study of the various questions connected with the medical service of the army, the minister of war has decided to establish a library, to be known as the Central Library of the Medical Service. It will be attached to the museum service of the army at Val-de-Grâce (THE JOURNAL, June 17, 1916, p. 1935) and will contain the collections of the present library at Val-de-Grâce, together with such other books as can, without inconvenience, be transferred from the existing libraries of the different departments of the medical service, and especially from the library of the consultative commission. This collection will be at the disposal (1) of the technical school of the medical service of the army, both for the teaching staff and for the pupils; (2) of all the officers of the medical service of the army on the simple presentation of their identity card; and (3), on permission accorded by the director, of all persons engaged in studies relating to the subject-matter of these collections.

IMPROVEMENTS IN THE SERVICE FOR DISCHARGE FROM THE ARMY FOR INJURY OR SICKNESS

A recent circular from the undersecretary of state of the medical service is calculated to speed up the procedure of discharge from the army, while surrounding it with guarantees clearly necessary in the interests of the state and of the individual. By this circular the depots for convalescents, where the wounded used to remain while awaiting examination of the recommendation for discharge concerning them, are suppressed. These inquiries were always very long drawn out, and the result was often far from satisfactory on account of the lack of specialists. These convalescent depots will be replaced by special discharge centers, whose business it will be to establish as rapidly as possible the medico-legal situation of convalescents. In future, the soldiers proposed for pension, discharge, auxiliary service, or for change of arm, must be sent to one of these discharge centers. The staff of these new formations, which will have no other business but the inquiries mentioned, will consist of specialists competent to give a technical opinion, each of whom must have passed some time at the medical consultative commission at Paris, in order to familiarize himself with the administrative mechanism which deals with pensions, discharges and rewards. At least one of these centers will be set up in each military region, and more if necessary. In this way it is hoped to obtain a unity of doctrine and practice in connection with discharge from the army. The same incapacity will be given the same weight in all parts of the country. The contradictory decisions which at the commencement caused so much trouble to the wounded will finally disappear; at the same time the decisions will be taken more rapidly.

SHRAPNEL BALL FREE IN LEFT VENTRICLE

Dr. Lobligeois communicated to the Académie de Médecine a case in which a shrapnel ball was free in the left ventricle of a wounded man who was, clinically speaking, completely cured and who did not appear to be in any way troubled by the presence of the projectile. The patient, wounded several months ago, was examined by roentgenoscopy after apparent cure, with a view to a search for the projectile, which was believed to have lodged in the left lung. Examination with the screen revealed the bullet immediately. It exhibited a characteristic dancing movement with each heart beat. In such a case a roentgenogram might have given only vague information, while on the screen a distinct, sharp image was visible.

THE RED CROSS IN ROUMANIA

The Union des Femmes de France has sent to Roumania a Red Cross commission under the patronage of Admiral Fournier, formerly commander in chief of the French fleet. This commission has taken with it 316 cases containing hospital material to the value of 60,000 francs ($11,580).

LONDON LETTER

LONDON, Nov. 22, 1916.

The Control of Venereal Diseases

The great naval base at Portsmouth is the first place at which the government scheme for the control and treatment of venereal diseases will be put in force. The following are the details: 1. The treatment will be carried out at the Royal Hospital under the direction of a specially trained medical officer. The clinic is to be open on three afternoons and evenings a week, female patients being seen from 3:30 to 5 and male patients from 6 to 7:30. Two beds will be provided for each sex. The treatment is to be free to every patient without distinction. 2. Laboratory facilities are to be provided at the Royal Hospital available for the medical officer in charge of the treatment center, for poor law and other medical officers and for physicians generally. 3. Salvarsan or its substitute is to be issued free to physicians by the medical officer of the treatment center and by the medical officer of health. 4. Apparatus for collecting material for examination from suspects is to be obtainable free of charge by physicians. 5. A committee is to be formed, including representatives from the various public bodies and voluntary agencies, to advise the council in regard to measures for disseminating information as to the scheme as well as for the control of venereal diseases. The strictest confidence will be observed in regard to persons attending the treatment center. Their names and addresses will be required by the medical officer solely for the purpose of communication with them in connection with their treatment and under no circumstances to be divulged to any third person.

Condemnation by British Medical Association of Compulsory Notification of Venereal Diseases

In a previous letter to THE JOURNAL it was stated that the question of the compulsory notification of venereal diseases is the subject of warm controversy. A committee of the British Medical Association, consisting of all the chairmen of standing committees, with the chairman of council in the chair, has issued the following statement: The Committee of Chairmen of the Standing Committee of the British Medical Association, after very careful consideration, has unanimously arrived at the conclusion that any system of compulsory notification of venereal diseases at the present time would entirely fail to obtain the results desired, for the following reasons: (1) It would lead to concealment, and (2) even if a public authority were notified that any particular person was suffering from one of these diseases, no effective measures could, in the large majority of cases, be taken for treatment. The committee considers that the time for any such procedure has not yet arrived, and that before considering how it might be carried into effect it will be necessary to provide facilities for free treatment, in accordance with the scheme set out in the circular issued by the Local Government Board, and also to prevent afflicted persons, while in an infectious state, from resorting to unqualified and incompetent persons for treatment, by rendering any such treatment, or the advertisement or sale of quack remedies, an offense against the law.

Purchase of the Sanatogen Company

As stated before, the English assets of Wulfing, including all stocks of sanatogen, formamint, albulactin and cystopurin, have been, like other German-owned undertakings in this country, sold by order of the government. They have been purchased by Lord Rhondda, a business magnate, in conjunction with others. In the future, therefore, the business will be entirely British and free from enemy capital or influence. The new proprietors announce that "the business will be conducted on those thorough scientific lines which have in the past given the Germans almost a monopoly in the pro-

duction of skilful organic compounds. Taking the present preparations as a foundation for the business, we intend, with the encouragement of the medical profession, to offer ample funds and facilities for experimental research work in synthetic chemistry, in the hope that English investigators may devise new products of no less value to the physician." Physicians are therefore asked at once "to resume prescribing the sanatogen group of products, which most physicians have only abandoned on patriotic grounds, and the unique efficacy of which has often been demonstrated by clinical and laboratory tests. During the time that this business was under the control of the government supervisor, many physicians informed us that they were disappointed with the therapeutic effects of the numerous imitations of sanatogen, etc., and would gladly utilize the original products as soon as these had been acquired by a British firm." The gullibility of the public and unfortunately of many physicians with regard to these preparations appears to be inexhaustible.

Dislike of New Australian Law by Nostrum Proprietors

The "Owners of Proprietary Articles" Section of the London Chamber of Commerce has issued a protest against the provisions of the recent commerce act, on the ground that it will have a far-reaching and disastrous effect on a "very important Australian trade." The act requires that all medicines or medical preparations or appliances for internal or external use shall be registered before they can be imported into Australia, and with the application for registration the owner shall deliver a description of the appliance or an exact and complete statement of the ingredients. One of the signatories of the letter is the late Sir Thomas Beecham. Among the proprietary preparations that are cited as being affected by the measure are Beecham's Pills, Woodward's Gripe Water, Powell's Balsam of Aniseed, Collis Browne's Chlorodyne, Guy's Tonic, Clarke's Blood Mixture, Phosferine, Steedman's Powders and Holloway's Pills and Ointment. These articles are stated to have a large sale in Australia, and are claimed to "have a well deserved reputation as being good and efficient household remedies."

Food Problem: Drastic Government Proposals

The problem of food supply has become a difficult though not a serious one. The causes are shortage of shipping for the carrying of food—due partly to the use of a large proportion of our ships for war purposes, and in less degree to destruction of allied as well as neutral shipping by submarines—and the shortage of agricultural labor, due to enlistment in the army. The government has at last resolved to take drastic action. One source of trouble is that not even high prices, more than double those existing before the war, have had much effect in limiting consumption, because wages have increased even more than this. The government is determined to limit the luxurious consumption of sugar in the form of sweets and confectionery. The potato crop is poor and a shortage is threatened of this imported food, of which the average consumption is one-half pound a day per head of the population. Everything is being done to encourage the importation and cultivation of potatoes. The appointment of one man to control the food supply of the country is foreshadowed. Waste of food in any manner will be made penal. Thus the destruction of food because the owner is not satisfied with the price offered will not be allowed. The manner in which food is to be used will be prescribed. Thus, as there is a shortage of milk, the government will not allow whole milk to be used to feed pigs. In spite of a recent crusade in the press against the use of white flour, from which many of the nutritious ingredients of wheat have been separated, this is still the main article from which bread is made. The government will prohibit the milling of this flour in future. Wheat now furnishes only 70 per cent. of this flour. In future the minimum yield must be 85 per cent. more (producing what is called "straight bread flour"). This will have the double advantage of furnishing a more nutritious flour and also of increasing the food supply of the country. It is estimated that the result will be 360,000,000 more quartern loaves than before. Food tickets are mentioned as a possibility; the government is asking for powers to issue them. They will insure that people cannot consume unnecessary food because they have the money to buy it. Cornering of the market will be prohibited. Maximum prices will be fixed for foods which are controlled by the government. Care will be taken not to check by this the importation of foods into the country.

Marriages

Ludwig Frederick Guldner, M.D., Davenport, Iowa, to Miss Bertha Harriett Rogers of Port Byron, Ill., at Davenport, November 25.

John Jay Harrington, M.D., Osawatomie, Kan., to Miss Elizabeth Waterman of St. George, Staten Island, N. Y., November 20.

Nathaniel Isadour Baskind, M.D., Chicago, to Miss Marian Propp of Des Moines, Iowa, in Chicago, November 22.

John Taggert Lemmel, M.D., Albany, Wis., to Miss Minnie Katherine McCartney of Belvidere, Ill., November 29.

Maurice Alvin Shillington, M.D., Glendive, Mont., to Miss Elizabeth Wieland of Brainerd, Minn., October 24.

Arthur Chester Strout, M.D., Garland, Me., to Miss Mabel Phoebe Ridley of Sanford, Me., November 30.

Arthur Irving Arneson, M.D., Emmons, Minn., to Miss Karina Emmons, both of Emmons, November 25.

William Gustavus Sachse, M.D., Morris, Ill., to Miss Edith Janet Naden of Newark, Ill., November 30.

Michael James Scott, M.D., to Miss Agnes Harrington, both of Butte, Mont., in Chicago, November 24.

Paul Green Pope, M.D., Bay St. Louis, Miss., to Miss Virginia Borum of Jackson, Miss., October 14.

Alphonse Herman Meyer, M.D., to Miss Eulalie Ashner, both of Memphis, Tenn., December 6.

Albert P. Mueller, M.D., Louisville, Ky., to Miss Lena Clifford of Cincinnati, November 18.

Frederick Elmer Leavitt, M.D., to Miss Jessie Margaret Row, both of St. Paul, November 28.

Deaths

John Halsey Benjamin, M.D., Riverhead, N. Y.; Bellevue Hospital Medical College, 1876; aged 61; a Fellow of the American Medical Association; for several terms president of the Suffolk County Medical Society; one of the largest stockholders in the Suffolk County Trust Company; who underwent an operation for hip joint disease at Dr. Pilcher's private hospital in Brooklyn; died at his home, November 26.

William Overholt Baker, M.D., Louisville, Ohio; University of Wooster, Cleveland, 1873; aged 88; a practitioner of Stark County since 1856; for twenty years pastor of the Church of Christ, Valley Chapel, formerly a member of the Ohio State Medical Association; died in Ingleside Hospital, Canton, Ohio, November 26, from bronchopneumonia.

Thomas Gregor Brodie, M.D., Toronto; M. R. C. S. England, 1890; aged 50; professor of physiology in the University of Toronto; who joined the staff of Canadian General Hospital, No. 4, in 1916, and was engaged in special research work in London, when the organization left for Saloniki; died suddenly in London, August 20, from angina pectoris.

Albius Mortimer Crittenden, M.D., Ferguson, Ky.; Vanderbilt University, Nashville, Tenn., 1894; aged 58; formerly a Fellow of the American Medical Association; a member of the Kentucky State Medical Association and once president of the Logan County Medical Society; died at his home, November 15, from carcinoma of the stomach.

Charles Young Hogsett, M.D., Fort Worth, Texas; University of Virginia, Charlottesville, 1895; aged 44; a Fellow of the American Medical Association and American Academy of Ophthalmology and Oto-Laryngology; a specialist in diseases of the eye, ear, nose and throat; died in a sanatorium in Saratoga Springs, N. Y., November 25.

Harry Malcolm Wasley, M.D., Shenandoah, Pa.; Medico-Chirurgical College, Philadelphia, 1900; aged 43; a Fellow of the American Medical Association; president of the Schuylkill County Medical Society; was found dead from heart disease on a mountain road near the Kehley Run colliery, November 28.

Harriett Douglass Whetten Showers, M.D., Meridian, Miss.; Cornell University, New York, 1900; aged 48; for eight years physician to the Meridian Women's College, and later superintendent and resident physician of Trinity Hospital, East New York; died in Long Island State Hospital, November 29.

Claude Bernard Foreman, M.D., Kane, Ill.; St. Louis College of Physicians and Surgeons, 1897; aged 41; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society; died in a hospital in Springfield, November 27, a week after an operation for appendicitis.

George Douglas Ramsey, M.D., Newport, R. I.; Tulane University, New Orleans, 1896; aged 47; a Fellow of the American Medical Association; major surgeon of volunteers during the Spanish-American War and first lieutenant, Medical Reserve Corps, U. S. Army; died at his home, November 27.

Robert Abner Brundage, M.D., Pittsburgh; Jefferson Medical College, 1906; aged 35; a Fellow of the American Medical Association; died in the Homeopathic Hospital, Pittsburgh, November 30, from the effects of injuries sustained when he was struck by an automobile a few hours before.

Edwin R. Montgomery, M.D., Louisville, Ky.; University of Louisville, Ky., 1867; aged 69; for two terms health officer of Louisville; supervising medical examiner for Kentucky for the Royal Arcanum for many years; died at the home of his daughter, in North Birmingham, Ala., November 27.

Stanley Arthur Walker, M.D., Toronto, Ont.; University of Toronto, Ont., 1915; aged 26; who resigned as house surgeon of the Toronto General Hospital to serve with the Canadian forces on the Somme front in France; was instantly killed in action by the explosion of a shell, October 15.

Lieut.-Col. G. M. Giles, Canadian Army Medical Corps, Kingston, Ont., F. R. C. S. England; formerly in the Indian Medical Service; aged 64; who went to England with the overseas force from Canada; died in Plymouth, England, in October, from a malignant growth.

William Lee Smith, M.D., Riderwood, Md.; College of Physicians and Surgeons, Baltimore, 1887; aged 54; a member of the Medical and Chirurgical Faculty of Maryland and once president of the Baltimore County Medical Association; died at his home, November 28.

Nora Johnson Ross, M.D., Chicago; Chicago College of Medicine and Surgery, 1911; aged 47; a Fellow of the American Medical Association and a member of the staff of the Mary Thompson Hospital; died at her home, December 1, from septicemia.

Jacob Brill Peters, M.D., Walden, N. Y.; New York University, New York, 1885; aged 63; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of New York; died at his home, November 23.

Albert Andrew Dougherty, M.D., Richland Center, Wis.; Starling Medical College, Columbus, Ohio, 1896; aged 51; at one time president of the Richland County Medical Society; died at his home, November 23, from angina pectoris.

S. Irick, Lamasco, Texas (registration, Second Texas Judicial District Board, 1893); aged 86; a veteran of the Civil War; for forty years a practitioner of Fannin County, Texas; died in Wetumka, Okla., November 22.

Matthias L. Lord, M.D., Rochester, N. Y.; New York University, New York, 1862; aged 77; a veteran of the Civil War; from 1868 to 1885 superintendent of the Monroe County Insane Hospital; died at his home, November 28.

William Fielding McQuitty, M.D., Correctionville, Iowa; University of Missouri, Columbia, 1879; aged 64; formerly a member of the Iowa State Medical Society; died at his home, about November 22, from cerebral hemorrhage.

George Kempton Reed, M.D., Philadelphia; Jefferson Medical College, 1874; aged 68; who retired from practice two years later and entered business with his father; died at his home, November 29, from pneumonia.

Edgar Harold McVicker, M.D., Toronto, Ont.; University of Toronto, Ont., 1915; aged 23; while on duty with the allied forces in France, in September, was struck by an exploding shell and instantly killed.

William G. Gombel, M.D., Baltimore; College of Physicians and Surgeons, Baltimore, 1877; aged 62; a Fellow of the American Medical Association; died at his home, November 29, from carcinoma of the throat.

James Kilbourne Young, M.D., Johnstown, N. Y.; Albany (N. Y.) Medical College, 1874; a member of the Medical Society of the State of New York; died at his home, November 26, from heart disease.

Robert Woolsey Odell, M.D., Detroit; University of Michigan, Detroit, 1866; aged 75; a Fellow of the American Medical Association; a veteran of the Civil War; died at his home, November 27.

George Franklin Munsey, M.D., Suncook, N. H.; Dartmouth Medical School, Hanover, N. H., 1879; aged 61; a member of the New Hampshire Medical Society; died at his home, November 26.

Frederick Robert Chapman, M.D., Saskatoon, Sask.; University of Toronto, 1908; aged 38; died at his home, August 16, from empyema, following perforation after accidental poisoning by lysol.

Edgar Cook Malin, M.D., Livermore, Iowa; State University of Iowa, Iowa City, 1890; aged 63; a Fellow of the American Medical Association; died at his home, October 23, from pneumonia.

Charles Louis Beil, M.D., New York; Bellevue Hospital Medical College, 1898; aged 40; a Fellow of the American Medical Association; died in Memorial Hospital, New York, November 30.

John Haughton Gimby, M.D., Sault Ste. Marie, Ont.; University of the Victoria College, Coburg, Ont., 1890; aged 61; died at his home, September 27, from carcinoma of the prostate.

Hosea J. E. Garrett, M.D., Hope, Ark.; Missouri Medical College, St. Louis, 1886; aged 55; a member of the Arkansas Medical Society; mayor of Hope; died at his home, November 17.

William Francis Scott, M.D., Port Washington, Wis.; Rush Medical College, 1887; aged 64; died in Mount Sinai Hospital, Milwaukee, November 28, from pernicious anemia.

Andrew Jackson Shore, Sailor Springs, Ill. (license, years of practice, Illinois, 1878); aged 81; a veteran of the Civil War; died at his home, November 20, from pneumonia.

Ryan T. Van Pelt, M.D., Anita, Iowa; Rush Medical College, 1877; aged 63; died at the home of his sister in South Bend, Ind., August 30, from carcinoma of the bladder.

William Calvin James, M.D., Lawson, Mo.; Vanderbilt University, Nashville, Tenn., 1880; aged 75; a practitioner for fifty-four years; died at his home; November 12.

Henrietta Hansine N. Brown, M.D., San Francisco; Minnesota Hospital College, Minneapolis, 1886; aged 67; died at her home, November 19, from bronchopneumonia.

L. Norman Monroe, M.D., Millerstown, Ohio; Medical College of Ohio, Cincinnati, 1881; aged 60; died at the home of his niece in St. Paris, Ohio, November 23.

Heward Sovereign Yorke, M.D., Waterford, Ont.; McGill University, Montreal, 1914; aged 28; died at his home, October 22, from acute dilatation of the heart.

John Clinton McPherson, M.D., Millington, N. J.; Hahnemann Medical College, Philadelphia, 1873; formerly of Chicago; died at his home, November 23.

John Bell Stagg, M.D., Pratt City, Ala.; Vanderbilt University, Nashville, Tenn., 1885; aged 56; died at his home, November 23, from cerebral hemorrhage.

William P. Pariseau, M.D., Ware, Mass.; Laval University, Quebec, 1904; aged 37; died in Hampden Hospital, Springfield, Mass., September 1, from diabetes.

Ira Sidney Hooker, M.D., Winner, S. D.; State University of Iowa, Iowa City, 1903; aged 40; died, October 25, at the South Dakota State Hospital, Yankton.

John E. Parrish, M.D., Memphis, Mo.; Washington University, St. Louis, 1869; aged 76; died at his home, November 20, from chronic catarrhal gastritis.

Herman Anscher, M.D., Chicago; Bennett Medical College, Chicago, 1890; aged 53; died at his home, November 24, from cerebral hemorrhage.

John Charles Crowell, M.D., Paw Paw, Ill.; Rush Medical College, 1891; aged 58; died at his home, November 17, from cerebral hemorrhage.

William H. Maghee, M.D., Lander, Wyo.; Jefferson Medical College, 1881; formerly of Evansville, Ind.; died at his home, November 21.

Moses Simmons Brundage, M.D., Rockford, Ill.; Rush Medical College, 1883; aged 58; died at his office, November 19, from heart disease.

James K. Pardee, Wichita, Kan. (license, years of practice, Kansas); aged 46; died at his home, November 9.

Robert Hughs, M.D., Denver; Jefferson Medical College, 1869; aged 74; died at his home, November 17.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

WALKER'S SULFO-SELENE CANCER REMEDY

Pertinent Comments by the New York Tribune

The most careful newspaper may sometimes err in handling topics of medical interest. Such errors mean that many newspaper readers are seriously misled, resulting in detriment not only to their purses but possibly to their health. There is, probably, no paper more careful of what it publishes than the New York *Tribune*. It was with some surprise, therefore, that admirers of this publication recently came across an article describing an alleged cancer treatment with a selenium preparation, the "treatment" being sponsored by one Dr. Charles H. Walker. The matter that follows is reprinted from the New York *Tribune*, Nov. 14, 1916, and shows that the *Tribune* stands ready to correct any errors into which it may be inadvertently led. The material reprinted consists of a letter protesting against the article in question, addressed to the *Tribune* and that paper's comment thereon:

"I have noticed with much regret the appearance on the front page of a recent issue of the *Tribune* of a method for the treatment of cancer with selenium preparations. My disappointment at this was the greater because the *Tribune* has stood for something better, notably in the articles by Mr. Samuel Hopkins Adams. Publication of 'cancer cures' by the newspapers is to be regretted for three reasons: 1. The information is incorrect, for none of these 'cancer cures' will cure cancer. 2. Not realizing this, many patients in the last stages of the disease are induced to part with an amount of money which often represents the savings of a lifetime, in the attempt to obtain a cure. I have known of instances in which wives or children were left in penury after the father's death from cancer because of the heavy charges for the use of an alleged cure. 3. Every such publication leads persons suffering from early cancer, which alone can be cured by operation, to refuse this, the only certain means of cure at present, in the hope that some medical treatment will be of value. Too often it happens that, by the time the patient finds the medical treatment is of no use, the cancer has grown to such an extent that it is inoperable. May I ask why the *Tribune* publishes articles of high value attacking unsubstantiated claims in advertising, and then, in a conspicuous place, publishes equally unsubstantiated claims in regard to the cure of cancer?

MEDICUS."

"The explanation is simple, but painful. The *Tribune* was 'caught' by a clever and ingenious exploitation of a semi-secret proprietary remedy. At the time of publication Dr. Charles H. Walker's 'Sulfo-Selene' was not known to belong in this category, or the article would never have been published. While there is no single statement in the interview, self-sought by Dr. Walker, which is provably false, the impression sought to be conveyed, that Sulfo-Selene will cure cancer, rests on no such foundation of evidence as to justify a reputable and responsible physician in setting it forth in the public prints.

"Dr. Walker's preparation had already failed of that recognition which would have given it a scientific status, at the hands of the recognized medical authorities. In 1914 it was presented before the American Medical Association's Council on Pharmacy and Chemistry, with a request that it be included in the list of recognized remedies. According to the information submitted, Sulfo-Selene is a 'mixture containing a selenium compound of undetermined composition, mixed with bile salts and diluents.' Although it was not then proposed as a cure for cancer, but merely as an alleviant to pain, the Council refused it recognition owing to lack of evidence. Further investigation early in the present year indicated that no curative claims were made for the composition. Since the assertion that it alleviates pain is hard to prove or disprove, the Council postponed publication of its findings.

"Then came Dr. Walker's successful attempt through the *Tribune* to inspire laymen with the belief that this selenium mixture, which had failed of scientific authorization, even as an alleviant, was actually a cure for the most dreaded of all diseases. It is a fair assumption that, in view of Sulfo-Selene's previous failure of recognition as a minor influence in cancer, any medical journal would have been chary of approving its major curative claims. There remained the lay press. Dr. Walker selected the *Tribune*, and, unfortunately for us, however defensible his own motive of publication may be, caught this paper napping.

"The reasons why such publication is a public injury are cogently set forth by 'Medicus,' whose actual name is of international note in cancer research. It remains for the *Tribune* only to acknowledge and regret its error; and by way of repairing it, in so far as possible, to make this statement:

"Dr. C. H. Walker's claims or implications for Sulfo-Selene as a cure for cancer, as set forth in the *Tribune* of October 16, are in no manner indorsed or shared by the *Tribune*, and should be estimated on no other basis than as the unsubstantiated assumption of a person interested in the sale of a semi-secret proprietary medicine."

AS CALIFORNIA SEES IT

What follows is taken from the *California State Journal of Medicine*. It reflects the attitude of the medical profession of the Golden State toward the work of the Council on Pharmacy and Chemistry:

"Both medicine and legitimate pharmacy would be greatly benefited if the medical profession took a keener interest in the work of the Council on Pharmacy and Chemistry of the American Medical Association.

"Thousands upon thousands of medicinal agents are upon the market which have little to commend them but the extravagant claims of mercenary manufacturers and the glib talk of wily detail men. Your journal can be ever so vigilant in the censorship of advertising. It avails little so long as the rank and file of the medical profession so liberally encourages these itinerant and questionable enterprises. Is medicine on so truly unstable a footing that the old and tried remedies must constantly give way to the new and unknown. Is it perhaps the relic of our former homage to magic and mysticism?

"The work of the Council has shown over and over again how the bulk of these 'new' agents are old-time and widely known remedies clothed in new form; with a new fanciful or catchy title, or disguised by 'aromatics,' or paraded as a new and wonderful chemical with marvelous properties. These myriad fakes emanate from the lowliest proprietary medicine vendor up to the largest producers of pharmaceuticals in the world.

"It is no longer very remunerative for manufacturers to confine themselves to high class chemicals and pharmaceuticals because of the keen competition in this field and the great falling off in the employment of drugs. Practically all of the big manufacturers devote their energies and advertising to the boosting of *specialties*—products in which they have proprietary interest or trade-mark rights. For these products fancy prices can be obtained and if physicians can be induced to prescribe them, pharmacists are obliged to stock them. You can upon a few moments' thought recall scores of such remedies. The physician is manifestly unable to protect himself against these impostions and to do this work for him the Council on Pharmacy and Chemistry was established."—*California State Journal of Medicine.*

MORE MISBRANDED NOSTRUMS

MRS. WINSLOW'S SOOTHING SYRUP

Information was filed against the makers of "Mrs. Winslow's Soothing Syrup," the Anglo-American Drug Company, on June 12, 1915, charging that the product was misbranded. The label declared the presence of 5 per cent. alcohol and one-tenth grain of morphin sulphate to each fluidounce together with oil of aniseed, carraway, coriander, jalap, senna and sugar syrup. The circular around the bottle contained among other statements the following:

"Mrs. Winslow's Soothing Syrup for children teething . . . is sure to regulate the bowels. Depend upon it, mothers, it will give . . . health to your infants. We have put up and sold this article for many years, and can say, in confidence, and truth . . . never has it failed in a single instance to effect a cure when used in time . . . This valuable preparation . . . has been used with never failing success in thousands of cases . . . It . . . invigorates the stomach and bowels . . . and gives tone and energy to the whole system."

These claims the federal authorities declared "false and fraudulent" and made "knowingly and in reckless and wanton

disregard of their truth or falsity." The company, which first entered a plea of not guilty, finally pleaded guilty and was fined $100.—[*Notice of Judgment No. 4110.*]

[NOTE.—"Mrs. Winslow's Soothing Syrup" no longer contains opiates. The company has, apparently, made up its mind that its old methods of doing business are out of joint with the times. The product now on the market is, apparently, a mixture of carminatives and laxatives.]

JOHNSON'S IODIZED EXTRACT OF SARSAPARILLA

The Michigan Drug Company, Detroit, sold a preparation called "Johnson's Iodized Extract of Sarsaparilla." The chemists who analyzed it reported that it was: "A simple vegetable preparation with only an appreciable amount of potassium iodid; alcohol and water used as a solvent." Misbranding was alleged because of the following statements regarding the therapeutic or curative effects of the preparation:

". . . a remedy for the following diseases Scrofula, . . . Erysipelas . . . Asthma. . . ."
". . . an excellent remedy for Rheumatism, Scrofula . . . and all Skin Diseases. . . ."
"A positive and permanent cure for Rheumatism"
". . . is an infallible cure for neuralgia, nervous exhaustion, nervous prostration. . . ."
". . . a radical and permanent cure for asthma. . . ."
"Painful and Suppressed Menses, . . . Leucorrhoea, Whites, Sterility, Ulceration of the Uterus, . . . all find relief, help, benefit and cure in Johnston's Sarsaparilla."

These claims the government declared to be false and fraudulent and applied knowingly and in wanton and reckless disregard of their truth or falsity. The company pleaded guilty and was fined $50.—[*Notice of Judgment No. 4120.*]

MATUSOW'S NULFEY

Harry Matusow of Philadelphia shipped in interstate commerce a quantity of Matusow's Nulfey which the federal authorities declared misbranded. The preparation was analyzed by the Bureau of Chemistry, which reported the following results:

Sodium salicylate, 51.8 per cent.
Alkaloid (probably berberin), present.
Colchicin, quinin, strychnin, morphin, arsenic, absent.
Emodin, present.

The government officials declared that the therapeutic claims made for the product were false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. These claims were made so as to create in the minds of purchasers the impression and belief that Matusow's Nulfey was effective as a remedy for paralysis, gout, and liver, kidney, bowel, bladder and stomach troubles, and effective as a blood purifier. Furthermore, that it was effective as a cure for locomotor ataxia, Bright's disease, diabetes, dropsy, hydrocele, stone in the kidney, all stomach troubles, gallstones, appendicitis and all skin diseases.

The case came on for trial before the court and a jury. After the submission of evidence and argument by counsel, Judge Thompson, before whom the case was heard, delivered a charge to the jury. In this he impressed on them that before they could bring in a charge of guilty it would be necessary for them to determine whether the therapeutic and curative claims were false, and if they were false that they would have to go still further and be satisfied beyond a reasonable doubt that the defendant in making them *knew* them to be false and intended to deceive and defraud. The jury retired and after due deliberation brought in a verdict of guilty. The defendant thereupon entered a motion for a new trial, but a few days later this was withdrawn and the court imposed a fine of $200 and costs.—[*Notice of Judgment No. 4190.*]

A Continuous Menace.—Some diseases are seasonal; some soon tire in their work, and retire to some other field; not so with consumption. The world is its field, it knows no time, all is opportunity. It feels no fear, but that of man who, it knows, could stay its ravages—if he could thoroughly realize his power and use it.—*Bulletin,* Newark (N. J.) Department of Health.

Correspondence

A National Leprosarium

To the Editor:—A bill (S 4086) providing for the national control of leprosy and the care of lepers is now pending before the United States Senate. This is the history of the bill. The Public Health Service and others interested in leprosy, particularly dermatologists, for years have realized that the incidence of this disease was gradually increasing in this country, and that it was therefore a menace. Whenever a case of leprosy is diagnosed in the community a great hue and cry results and there is ample opportunity for hysterical journalism. Although we realize that leprosy is not one of the most infectious of diseases, yet we do not know the exact manner of its transmission from one person to another. The cycle of the organism and the conditions of infection with it are not known. However, history and past experience demonstrate its infectious nature. Lepers moving from place to place in interstate traffic are, without doubt, a menace to other persons. Experience has shown that the only method of control of this disease is through isolation and segregation. This has been illustrated recently by government control of leprosy in the Hawaiian Islands and in the Philippine Islands.

In 1914 a concerted effort was made to persuade the United States government to provide governmental care and treatment for these cases. In June of that year resolutions were adopted by the Section on Dermatology of the American Medical Association recommending "the passage by Congress of a law for the comprehensive care and control of leprosy by the federal government." These resolutions were referred to the House of Delegates, and passed June 26, 1914. Similar resolutions were adopted by the American Dermatological Association at its meeting that year. The various state associations and medical societies throughout the country have recognized the need of a national leprosarium, and have officially urged the passage of a law providing for one.

At the beginning of the Sixty-Fourth Congress bills were introduced in both the House and the Senate by Mr. Adamson and Senator Ransdall, proposing the establishment of a national home for lepers. The House bill was reported favorably by the Committee on Interstate and Foreign Commerce, and passed unanimously. The Senate Committee on Public Health and National Quarantine held elaborate hearings on this bill in March, 1916, and reported it favorably. It was reached on the calendar during April, 1916, but Senator Thomas of Colorado objected to its unanimous passage, and it was left to be taken up in its regular order. This bill should be supported by the medical profession of the United States. Every physician knows the menace of leprosy. Others interested in the passage of this bill should communicate, by personal letter or telegram or indirectly through influential friends, with their Congressmen or Senators urging the latter to interest themselves, not only in the passage of the bill, but in securing for it as early a consideration as possible.

M. F. ENGMAN, M.D., St. Louis.

Relations of the Body and the Spirit

To the Editor:—Of perennial and universal interest is the point of fusion between the body and the spirit, the psyche—the soul, *élan vital,* cosmic urge, or whatever words are adequate to convey the idea of the immaterial essence. Being in correspondence with Prof. James H. Hyslop of the American Society for Psychical Research, I begged him to put in writing briefly what he and those he represents (mundane and extramundane) are prepared to aver of this blending of soul and body. I enclose his letter.

J. MADISON TAYLOR, M.D., Philadelphia.

My dear Dr. Taylor:—The reminder that somatic influences are now regarded as playing an important part in "mental queernesses" is fully appreciated, and I take the occasion to explain just what my position is in regard to the nature and interest of psychic phenomena.

Most of the medical public, most of the psychologists, and perhaps all laymen assume that, in contending for the supernormal, we disregard

somatic and internal influences connected with such facts. But I myself would concede to all medical men, psychologists and laymen any amount of somatic and internal influences which they might either assume or prove. What I contend for is that in a great many cases the etiology of the phenomena includes extra-organic stimuli, which may be modified in any way you please or imagine by somatic agencies.

We assume that the subconscious of all psychics or automatists will do much to determine the form of the phenomena as they are observed and recorded. For instance, the language and manner of delivering so-called messages will partake of the habits, forms of expression and manners of the psychic. The question with us is whether their occurrence has been initiated within the organism or without it.

Hence, instead of setting up somatic influences as antagonistic to the existence of the supernormal, it may mean that some sort of telepathic or spiritistic influences are superposed on the somatic and internal causes, often completely interfused with them. If we could get the scientific world to recognize that we are not antagonizing their point of view, but merely adding to the knowledge of the complexities of the phenomena, we might get a more ready hearing. I wish to be understood merely as ready to conform my theories to any and all facts that may be established in physics, chemistry, physiology, biology and psychology. The primary question is whether somatic influences will account for all the phenomena. If they do not, we are entitled to appeal to extra-organic stimuli and then determine whether they are physical or mental; and, if mental, whether they are telepathic or spiritistic.

JAMES H. HYSLOP.

Good Medicine

To the Editor:—Having devised an apparatus for outdoor exercise and not knowing what to do with it, I have concluded to submit it to THE JOURNAL for your consideration. The device is not patented, and I doubt if it is patentable; anyhow, I hold no claims on the suggestion. The enclosed

Apparatus for outdoor exercise.

drawing, while poorly executed, is sufficiently intelligible to show about what the device is and how it is to be used. It is, in fact, an outdoor gymnasium. It supplies outdoor air, deep breathing, companionship, motion, changing scenery, and rhythmical exercise to all the muscles of the body without strain or violence to any one part. Schools, sanatoriums, clubs, societies, etc., might use such a contrivance to advantage. At health resorts and other like places such an apparatus might be kept for hire at so much an hour. There are a vast number of people, old and young, male and female, who need just such exercise as this contrivance would afford but get nothing in that line whatever.

If I have taken up your time with something wholly outside your domain and possibly not worthy of your attention, please pardon me. I have felt that this was one thing that would receive the endorsement of all physicians.

The design, as illustrated, is provided with six hand and foot levers arranged in pairs.

W. R. HEYLMUN, M.D., Iola, Kan.

The Ventilation of Operating Rooms

To the Editor:—I was rather surprised to note in THE JOURNAL, Dec. 2, 1916, p. 1688, the statement made by Dr. E. P. S. Miller of Chicago in commenting on the lack of ventilation in operating rooms:

"When you consider the amount of fresh air that is necessary to keep the carbon dioxid below the safety limit, it is strange that more patients do not succumb."

This is not in line with modern ideas relative to ventilation. It is quite possible that proper attention is not given to the ventilation of operating rooms, but Dr. Miller does not cover the chief argument against present conditions.

H. M. BRACKEN, M.D., St. Paul.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ZAMBESI ULCER—WHITE POCKS

To the Editor:—Can you give me a concise description of, and the infecting organisms in, Zambesi ulcer and white pocks?

R. F. EDWARDS, M.D., Newark, N. J.

ANSWER.—1. The main points connected with Zambesi ulcer, according to Bruce, are: (a) it is found, with rare exceptions, in one part of the body—below the knee; (b) it is usually single, seldom double, and more rarely in the form of two, or perhaps three, small ulcers on the same leg; (c) it does not spread, but exhibits immediate sloughing of the area attacked, remains a week or more and then heals by granulation; (d) it produces no constitutional disturbances nor enlargement of the lymphatic glands; (e) it is invariably associated with the presence of a spirillum and a large fusiform bacillus.

It is said that one attack gives considerable protection but not immunity, as years later the same person may develop mild small ulcers. It is said also to be met with only in the flat grass lands, such as the Zambesi delta, but this statement is not reliable. (THE JOURNAL A. M. A., Feb. 11, 1911, p 461, abstracted from an article by Bruce, W. J., in *Jour. Trop. Med.*, 1911, p. 1.) Since this description no other seems to have appeared. There seems to be another disease known by the name of Zambesi ulcer, which is attributed to the burrowing into the tissues of the larva of a dipterous fly.

The most recent description of the varicella-like disease occurring in Brazil and known as "white pocks," appears to be contained in the article by Rudolph (*München. med. Wchnschr.*, Feb. 7, 1911). He describes this disease as a pustular exanthematous fever closely resembling smallpox in its mode of onset, in the early fall of temperature, in the presence of characteristic bodies, presently to be described, in the exudate, and in the absolute immunity it confers against smallpox. The disease differs from smallpox by the fact that the immunity which it confers against vaccination lasts only for six months, by its benign character (the mortality being only from 2 to 2.5 per cent.), in the greater range of the early fall of temperature, in the histologic and external appearance of the pustule, which is situated in the horny layer of the epidermis and not in the rete malpighii and, finally, in the character of the scar, which is umbilicate and has a tendency to be elliptical and for the most part to disappear with time. Mense (Handbuch der Tropenkrankheiten, second edition, Vol. III, pp. 632-633) gives a description of this and of a number of other variola affections, and discusses their etiology and relations. Rudolph's description of the organism seen by him in the pustules is: a sharply defined, small, round, coccoid organism staining with Giemsa and basic stains, not stained by Gram, nonmotile, and not yielding any growth on the ordinary culture mediums. It will be seen that this description is identical with that of the bodies found in variola and vaccinia.

ELECTIVE SERVICE OF FIRST LIEUTENANT, MEDICAL RESERVE CORPS

To the Editor:—In your Current Comment (THE JOURNAL, Oct. 28, 1916) on the Medical Reserve Corps, you say that a first lieutenant of the Officers' Reserve Corps can be called on during peace. May I ask if this might not be a mistake, as I understand that no officer can be called out during peace? If they could, those of us who are in our prime, who now belong to the Reserve Corps, who are prompted by patriotic motives and who would drop everything, practice, friends, etc., should we become involved in actual war, would be subject to call to some barracks to examine recruits, and I would not want any one to call me a "hyphen" should I not desire to serve my country in such a capacity. If the new act of June, 1916, establishing an Officers'

Reserve Corps contains a provision such as you print in that issue, unless there are more specific details as to what service during peace we would be called to render, I do not feel that a great number of the present Medical Reserve Corps would enlist in the Officers' Reserve Corps.

FRED H. BLOOMHARDT, M.D., Altoona, Pa.

ANSWER.—First lieutenants of the Medical Section, Officers' Reserve Corps, may be called into active duty in time of peace under the following conditions:

"That the Secretary of War may in time of peace order first lieutenants of the Medical Section of the Officers' Reserve Corps, with their consent, to active duty in the service of the United States in such numbers as the public interest may require . . . and may relieve them when their services are no longer necessary."

The phrase "with their consent" makes it voluntary on the part of such officers whether or not they shall respond to call in time of peace.

THE RECTAL TUBE AND HIGH INJECTIONS

To the Editor:—Permit me to correct an error in your very conclusive reply to Dr. Bogardus' query regarding the rectal tube and high injections (THE JOURNAL, Dec. 2, 1916, p. 1688).

Referring to my article, you say, "G. S. Hanes of Louisville in 1909 claimed that it could be done, but failed to demonstrate it by roentgenograms, some of his own pictures showing the tube coiled in the rectum." As a matter of fact, my contention was that rectal tubes, when supposed to have entered the colon, would be coiled in the rectum or sigmoid. This I demonstrated by a series of roentgenograms in which every conceivable effort was made to pass the tube into the colon. All the pictures in the article to which you refer, except one, show the tubes coiled or bent on themselves in such a manner as prevented their entering the colon. The exception shown in Figure 5 is a Wales bougie passed well into the sigmoid through a proctoscope introduced with the patient in the inverted posture. I stated that I had another roentgenogram which showed a bougie introduced with the patient in the lateral position, in which instance the bougie was bent on itself with the distal end returning almost to the anal opening. Again I said that I had succeeded in passing a rectal tube around to the cecum, believing that I had accomplished more than could ordinarily be done. It was stated in my article to which you refer that it was a preliminary report, and that the investigations were of a nature which had never before been undertaken or, at least, made public.

After further studies on the living subject and also the cadaver, I was convinced that I had misinterpreted the case in which the tube was supposed to have been passed into the cecum and had mistaken a very long sigmoid for the colon. I stated the same in an article published in the *Transactions of the American Proctologic Society*, 1911, p. 95, and also in an article in the *Louisville Monthly Journal of Medicine and Surgery*, February, 1912, p. 262. In the discussion of the paper of Mayo of Detroit, to which you refer, Drs. Frank and Sherrill of Louisville, who are familiar with my work, said my conclusions were that long tubes seldom, if ever, were passed into the colon. In Dr. Sherrill's discussion he made reference to further experiments which I had made on the cadaver proving that a rectal tube could not be introduced into a normal colon.

In an article published in the *Kentucky Medical Journal*, Jan. 1, 1910, and also in the *Transactions of the American Proctologic Society*, 1913, the subject of the introduction of colon tubes is discussed.

GRANVILLE S. HANES, M.D., Louisville, Ky.

PSORIASIS CAPITIS—USE OF CHRYSAROBIN

To the Editor:—1. Will you kindly suggest the latest treatment for psoriasis capitis?

2. How can chrysarobin be prepared so that it will not stain the clothes?

Thank you, and please omit my name. M. M. K.

ANSWER.—1. There is no new treatment for psoriasis of the scalp worthy of recommendation. An ointment containing salicylic acid, 30 grains, and ammoniated mercury, 1 dram to an ounce of petrolatum, is a good one for such cases. All of the books on skin diseases describe the present accepted methods for treating psoriasis of the scalp.

2. Chrysarobin cannot be prepared so that it will not stain clothes. It can be applied to the skin in solution of gutta percha, N. F., or flexible collodion, and this prevents it from coming in contact with the clothing, but this is not a very effective way of using chrysarobin.

ACID OF GRAPEFRUIT

To the Editor:—What is the acid of grapefruit?

E. H. KING, M.D., Muscatine, Iowa.

ANSWER.—Citric acid. Grapefruit (*citrus decumana*) belongs to the citrus family, which is represented also by the orange and lemon. The total acidity of the juice of the grapefruit corresponds to 2.7 per cent. citric acid; this is stated as being greater than that of orange juice, and less than that of lemon juice.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 9. Chairman, Dr. W. H. Sanders, Montgomery.

ALASKA: Juneau, Jan. 3. Sec., Dr. H. C. DeVighne, Juneau.

ARIZONA: Phoenix, Jan. 2. Sec., John Wix Thomas, 306 Goodrich Bldg., Phoenix.

CALIFORNIA: Sacramento, Jan. 9. Sec., Dr. C. B. Pinkham, Forum Bldg., Sacramento.

COLORADO: Denver, Jan. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Jan. 9. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

ILLINOIS: Chicago, Jan. 24-26. Sec., Dr. C. St. Clair Drake, Capitol Bldg., Springfield.

INDIANA: Indianapolis, Jan. 9-11. Sec., Dr. W. T. Gott, 120 State House, Indianapolis.

MINNESOTA: Minneapolis, Jan. 2-5. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

NEW HAMPSHIRE: Concord, Dec. 18-19. Sec., Dr. W. T. Crosby, Beacon Bldg., Manchester.

NEW MEXICO: Santa Fe, Jan. 8. Sec., Dr. W. E. Kaser, East Las Vegas.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, Grand Forks.

OKLAHOMA: Oklahoma City, Jan. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

OREGON: Portland, Jan. 2. Sec., Dr. Herbert S. Nichols, 802 Corbett Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 9-11. Sec., Nathan C. Schaeffer, Capitol Bldg., Harrisburg.

RHODE ISLAND: Providence, Jan. 4-5. Sec., Dr. G. T. Swarts, State House, Providence.

SOUTH DAKOTA: Pierre, Jan. 10. Sec., Dr. P. B. Jenkins, Wauhay.

WASHINGTON: Spokane, Jan. 2. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

WISCONSIN: Madison, Jan. 9-11. Sec., Dr. John M. Dodd, 220 E. 2nd St., Ashland.

CLINICAL CLERKSHIPS IN THE FIRST SURGICAL (CORNELL) DIVISION AT NEW YORK HOSPITAL

BURTON JAMES LEE, M.D.
Associate Professor of Clinical Surgery, Cornell University Medical College
NEW YORK

During the past three years, a plan of instruction has been developed for the teaching of student clerks in the wards of New York Hospital in the service of Dr. Charles L. Gibson. The course arranged has received the enthusiastic approval of the student body. It may be profitable, therefore, to give a brief summary of the general scheme followed.

Clinical clerkships are provided for both fourth and third year men in the second and third college terms, respectively. Sections of eight at a time, for a period of five weeks, devote their entire time to the surgical wards in the hospital, with the exception of two afternoons a week, when work at the college is concentrated.

When the student first comes to the hospital, there is an informal talk with the instructors, the work to be done being briefly outlined. His obligations to the hospital and the patient are clearly stated, and he is made to understand that success as a clinical clerk depends largely on the tact and courtesy which he exercises in his dealings with patients and nurses. Each student is made to feel at the outset that he is an intrinsic, useful part of the surgical working force, and not an outsider. Responsibilities are thrown on him immediately, with certain definite assignments, so that he knows at the very beginning just what is expected of him.

Three of the students are on duty in the operating room each day, serving in the capacity of anesthetist, assistant at the wound, or family physician. The remaining five are occupied with history taking, physical examinations, general and special work in the laboratory, or attending special operations.

That responsibility may properly be placed on student as well as on teacher, the students are divided into groups of two, each group being assigned to a separate instructor. The attending surgeon, each associate surgeon, and the assistant surgeon are, therefore, each in charge of one group. His-

tories, physical examinations and descriptions of operations must have the written approval of the particular instructor assigned to the group in charge of a case, and questions of diagnosis are discussed with him. This assignment of students in pairs gives each man an intimate knowledge of double the number of cases which he would otherwise have, and the two students in each group cooperate, one doing ward or laboratory work while the other is engaged in the operating room.

One of the hospital wards is chosen as a general headquarters for information. There is a bulletin board in this ward, on which are placed an outline of the students' duties, under the head of general instructions, assignments of cases, the order of rotation for operating room service, as assistant and anesthetist, and various special notices.

GENERAL INSTRUCTIONS TO CLINICAL CLERKS IN SURGERY AT THE NEW YORK HOSPITAL

1. *New Patients.*—Consult the file for new cases and proceed as soon as possible with any new cases assigned to you as follows:

A. Clinical history.

B. Physical examination. While examining any patient in the female ward, request the presence of a nurse during such examination. No pelvic examination to be made save by direction of the attending surgeon, associate attending surgeon or house surgeon and in the presence of one of these surgeons.

C. Blood examinations—routine.

D. Urine analysis—routine.

E. Special examinations.

F. Write plainly your tentative diagnosis after the physical examination of each case and sign your name.

2. *Old Patients.*—A. Visit each old patient, making such examination as seems necessary, and add a note on the chart.

B. Attend the surgical dressings on your patients by the house surgeon whenever it is possible. "Most of the dressings are done between 7:30 and 9 a. m."

C. Consult the file "special examinations" and proceed with such work as is there assigned to you.

3. *Operations.*—Inspect list of operations for the day, and arrange to be present in the operating room when your patients are being operated on. Each group of two is expected to have a representative in the operating room when any patient under the care of this group is being operated on, the man thus serving being technically the family physician. Consult the schedule for operating-room services. Those on duty as assistant in the operating room must be scrubbed up at 8:30 a. m. It is essential that this time schedule be rigidly adhered to that the routine work of the hospital may not be interfered with. Violation of this rule forfeits the privilege for the day. At the termination of the operation, the man acting as assistant surgeon dictates in the presence of the surgeon the operative procedure, the family physician taking down the dictation, placing the operation on record at the earliest possible moment.

4. *Rounds.*—A. Field rounds are held on Monday at 3 p. m. by the surgeon and entire staff.

B. Further daily rounds are made by the associate and assistant attending surgeons.

5. Special bedside clinics are held with demonstrations in diseases of bones and joints at intervals during the course.

6. *Surgical and Gynecologic Pathology.*—These exercises are held in the pathologic laboratory, Wednesday, Thursday and Saturday afternoons at 3:30 o'clock. An attempt is made to present fully interesting cases occurring in the service illustrating important points in surgical and gynecologic pathology, endeavoring to correlate the clinical findings with the pathologic. The abundant surgical and gynecologic material of the hospital is freely made use of.

7. *Clinical Pathology.*—Individual attention is given to the students by the assistant in clinical pathology, who aids them in the performance and interpretation of various tasks. Students are requested to confer with the instructor freely in connection with this work.

8. *Instructions in Anesthesia.*—A talk on anesthesia is given to the students by the anesthetist in the service. Students must observe their assignment for instruction in anesthesia in the operating room. Students on duty for the day must be in the operating room ready for work at 8:30 a. m. Violation of this rule forfeits the privilege for the day.

9. *Gynecologic Diagnosis.*—In the outpatient department: Interesting cases for gynecologic diagnosis are studied, and ample opportunities are afforded students for making pelvic examinations under proper supervision. This is one of the most instructive exercises of the course.

10. *Necropsies* (by the pathologist and staff).—Students are expected to attend every necropsy occurring in connection with both the surgical and medical services. This is one of the valuable features of clinical clerkship, and students are earnestly requested to be on hand for every postmortem examination. A bell gives notice of the beginning of every necropsy.

11. *Emergency Operations.*—After 6 p. m., immediate notice of a proposed operation will be telephoned to such members of the class as may desire it. Attendance at these operations is purely voluntary, but very desirable, as cases of emergency character are numerous and interesting.

12. *Collateral Reading.*—It will be necessary for the students to supplement their work throughout the service at the hospital with collateral reading. The library in the record room is available for the use of students from 9 a. m. to 5 p. m.

As the plan works out, practically each group comes in personal contact with a large number of cases. The opportunities which such a course offers to the ambitious student are tremendous. Surgery, as it is, is spread out before him, and he is an integral and important part of it. He comes to realize that a careful history is essential if an accurate diagnosis is to be reached. A physical examination, to be of any value, cannot be perfunctory, and the value of minute observation is emphasized. His knowledge of his own cases embraces every angle from which they may be studied, from the ward work before and after operation, to operative technic, laboratory work, and finally the intimate personal contact which is so essential to the successful practice of surgery.

With rare exceptions, the students gain the confidence of the patient to a remarkable degree. Their enthusiasm for surgical knowledge has made the course pleasurable and profitable to student and instructor, for they have proved themselves willing, teachable assistants, looking for the truth.

128 East Seventy-Third Street.

Tennessee June Report

Dr. A. B. De Loach, secretary of the Tennessee State Board of Medical Examiners, reports the written examination held at Knoxville, Memphis and Nashville, June 16-17, 1916. The total number of subjects examined in was 8; total number of questions asked, 64; percentage required to pass, 75. The total number of candidates examined was 148, of whom 128 passed and 20 failed. Fourteen candidates were licensed through reciprocity and 5 were granted reregistration certificates. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Birmingham Medical College	(1915)	75.9
College of Physicians and Surgeons, Little Rock	(1911)	87.4
Southern College of Medicine and Surgery	(1914)	75.2
College of Medicine and Surgery (Physiomedical)	(1911)	80*
Kentucky University	(1902)	77.6
Tulane University of Louisiana	(1907)	84.1
Tufts College	(1913)	85.7
National Univ. of Art and Sciences	(1915)	80.1; (1916) 85.1
Columbia University	(1912)	90
Jefferson Medical College of Philadelphia	(1913)	85.1
Medico-Chirurgical College of Philadelphia	(1912)	79.2
Lincoln Memorial University (1914) 75.5; (1916) 81, 82.2, 82.9, 83.9, 84.2, 84.5, 85, 85.5, 86.2.		
Meharry Medical College (1912) 78.5; (1916) 75, 75.1, 75.2, 75.2, 75.5, 75.6, 76.7, 76.9, 76.9, 77.1, 77.9, 78.1, 78.4, 78.7, 78.9, 78.9, 80.6, 80.7, 81.1, 82, 83.2, 83.5, 84.4, 84.5, 88, 89.		
Memphis Hospital Medical College	(1912)	75
University of the South	(1902)	84.1
University of Tennessee (1913) 80.5; (1914) 81.4; (1915) 81.4; (1916) 78, 79.7, 80.5, 81.6, 83.4, 84, 84.2, 85, 85.2, 86.2, 87, 87.5, 89.4.		
University of West Tennessee (1914) 88; (1915) 75.2; (1916) 75, 77.5, 79.9.		
Vanderbilt University (1915) 82.4; (1916) 79.2, 80.2, 80.2, 80.2, 80.6, 80.7, 80.9, 81.2, 81.4, 81.4, 81.7, 81.9, 82.1, 82.1, 82.5, 82.7, 82.9, 83, 83.4, 83.7, 83.7, 83.9, 84.2, 84.4, 84.5, 84.6, 85.1, 85.1, 85.2, 85.4, 85.4, 85.5, 85.6, 85.9, 86.4, 86.5, 86.7, 86.7, 87, 87.4, 87.6, 87.9, 88.6, 89, 89, 89.1, 89.7, 90.4, 92.1, 94.4, 96.1, 98.1, 98.2.		
Queen's University	(1911)	81.4
FAILED		
Meharry Medical College (1912) 44.7; (1914) 59.7, 70.6; (1915) 53; (1916), 47, 53, 54, 58, 70.4, 71.6, 72.		
University of West Tennessee (1909) 60.5; (1914) 68.5; (1915) 54.5, 58.6, 63.6, 64, 70.1; (1916) 71.4, 73.4.		

* Graduation not verified.

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
University of Arkansas	(1902)	Arkansas
Rush Medical College	(1910)	Utah
Indiana University	(1909)	Indiana
Missouri Medical College	(1885)	Arkansas
Starling Medical College	(1897)	Missouri
University of Pennsylvania	(1907)	Penna.
Med. Coll. of the State of South Carolina	(1914)	N. Carolina
Meharry Medical College	(1911)	Arkansas
Memphis Hosp. Med. Coll.	(1898) Oklahoma; (1902)	Arkansas
University of Nashville	(1901)	Arkansas
University of the South	(1907)	Georgia
Medical College of Virginia	(1895) (1906)	Virginia

Connecticut Eclectic July Report

Dr. T. S. Hodge, secretary of the Connecticut Eclectic Medical Examining Board, reports that one candidate, a graduate of the Georgia College of Eclectic Medicine and Surgery, in 1912, was licensed, July 11, 1916, through reciprocity with Georgia.

Social Medicine, Medical Economics and Miscellany

HEALTH INSURANCE CONFERENCE

The American Association for Labor Legislation will hold its tenth annual meeting at Columbus, Ohio, Wednesday, Thursday and Friday, December 27-29. The convention will open with an evening session in the form of a joint meeting of the American Economic Association, the American Sociological Society, the American Statistical Association and the American Association for Labor Legislation. Addresses will be given by the presidents of the four associations—Prof. Thomas N. Carver, Dr. George E. Vincent, Mr. Charles P. Neill and Prof. Irving Fisher. The subject for the evening meeting will be: "The Need for Health Insurance." On Thursday, morning and afternoon sessions will be held at Rankin Hall. At the morning session, Max Senior of Cincinnati, chairman of the Social Insurance Committee of the National Conference of Charities and Correction, will preside. Miss Julia Lathrop, chief of the federal Children's Bureau, will speak on the "Public Protection of Maternity," and Dr. Alexander Lambert of New York, chairman of the Judicial Council and of the Social Insurance Committee of the American Medical Association, will discuss "Medical Organization under Health Insurance." At the afternoon session, Hon. Rufus M. Potts of Springfield, Ill., state commissioner of insurance for Illinois and chairman of the Social Insurance Committee of the National Convention of Insurance Commissioners, will preside. Addresses will be given by Dr. I. M. Rubinow, secretary of the Social Insurance Committee of the American Medical Association, on "Health Insurance through Local Mutual Funds"; by Hon. John J. Lentz, president of the American Insurance Union of Columbus, Ohio, on "Fraternal Societies under Universal Health Insurance"; by Dr. Harry E. Mock of Chicago, medical director of Sears, Roebuck & Co., and secretary of the National Association of Industrial Physicians and Surgeons, on "Establishment Funds under Universal Health Insurance"; and by Mr. Thomas J. Duffy of the Ohio Industrial Commission, on "Trade Union Sick Funds and Universal Health Insurance." On Friday morning, a session on working hours in continuous industries will be held at the Ohio State University. Mr. John A. Voll, president of the Ohio State Federation of Labor, will preside. The discussion on "One Day of Rest in Seven by State and Federal Legislation" will be led by Mr. John A. Fitch, editor of the industrial department of the *Survey*. "Eight Hour Shifts by Federal Legislation" will be discussed by Prof. John R. Commons, professor of political economy of the University of Wisconsin. "Practical Aspect of the Weekly Day of Rest and the Eight Hour Shift in Continuous Industries" will be discussed by Mr. William B. Dickson, second vice president of the Midvale Steel and Ordnance Company. In the afternoon, the annual business meeting of the American Association for Labor Legislation will be held, at which the reports of various officers and committees will be presented and the legislative program for the coming year discussed. An evening session will be held at the Athletic Club, the subject being "American Economic Problems after the European War." Mr. Roger W. Babson of Wellesley Hills will consider the question with respect to the gold supply; Mr. W. Jett Lauck of Washington, D. C., with respect to immigration; Prof. T. S. Adams of Yale University, with respect to the attitude of governments toward industry; Mrs. Haviland H. Lund, with respect to the redistribution of labor now employed in producing war supplies, and Mr. John R. Wildman of New York University, with respect to accounting and industrial preparedness.

Saturday noon a joint session of the American Association for Labor Legislation and the American Political Science Association will be held at the Hotel Sinton, Cincinnati, under the auspices of the City Club, Cincinnati. Prof. Gerrit S. Sykes, president of the City Club of Cincinnati, will preside. Mr. Miles M. Dawson of New York will speak on the "Principles of Health Insurance."

Book Notices

PRINCIPLES OF DIAGNOSIS AND TREATMENT IN HEART AFFECTIONS. By Sir James Mackenzie, M.D., F.R.S. Cloth. Price, $2.50. Pp. 264. New York: Oxford University Press, 1916.

This is a series of lectures prepared for postgraduate students who are assumed to know something of heart disease from clinical experience. The book cannot, therefore, be justly criticized for omissions, for overemphasis placed on certain features, and for a slighting of others which might seem important, nor can we take the author to task for employing a colloquial style and for injecting into his lectures a certain personal element which might be in questionable taste under other circumstances. The local conditions under which these talks were to be given explain and excuse their somewhat discursive fragmentary and familiar character. This familiarity, by the way, is one of the charms of the work. We seem to be listening to the fireside talk of a practitioner of thirty-five or forty years of rich experience, who has been a keen observer of facts, a seeker after new light, one who thinks independently and has the courage to formulate for himself his views, even though his conclusions may not agree with those of the profession at large. What Mackenzie believes, he believes strongly; what he does not believe, he renounces and denounces in no uncertain manner; what he does not understand, he admits frankly. He is not bound by tradition, has little respect for authority, has a healthy skepticism, and is interestingly, sometimes invitingly, dogmatic.

The book is one to make the practitioner stop and think, to take account of stock, to see into how many foolish errors he has fallen, how he may best readjust himself to the new knowledge, and how he, plain practitioner as he is, may follow the example of the distinguished author and be a real investigator, though he may lack the supposed advantages of the laboratory or the ward of the hospital. Mackenzie, in fact, tries to stimulate the general practitioner to research by insisting that the practitioner, not the laboratory or hospital worker, has the opportunity of pursuing the clinical study of a disease of the heart from its slight beginning through to the end. Only the family doctor can keep in close touch with the patient during the many years of his life.

The text of Mackenzie's lectures—we had almost said sermon—is "heart failure." Heart failure is "that condition in which the heart is unable to maintain an efficient circulation during the efforts necessary for the daily life of the individual." The essence of heart failure is the condition of the muscle. All through the book, whether discussing valvular lesions, hypertrophy or irregularitis, Mackenzie reminds us that the important fact after all is not the murmur, not the size of the heart, not its rhythm, not any single symptom or sign, but the power of the heart muscle to respond to the ordinary demands of daily life. That this lesson will bear repeating and emphasizing must be admitted. But we contend that there is an element of unfairness in practically assuming that not only general practitioners but nearly all writers, teachers, "distinguished physicians" and hospital physicians are still paying attention to the murmur, still absorbed in taking the blood pressure or the polygraphic tracing, and forgetting to ask the question, Is the heart failing or in danger of doing so? We recall that about twenty years ago numerous papers, at least here in America, appeared emphasizing the importance of the heart muscle and the value of other signs and symptoms than murmur; we recall that Grebe has written with clear vision as to the value of the myocardium, and that Martius has dwelt on the reserve power of the heart muscle. In Romberg's textbook one will find many pages devoted to a consideration of chronic insufficiency of the heart muscle; and Jürgensen, twenty years ago, printed in large type, almost at the beginning of his article in Nothnagel's system, "Pancarditis is the diagnosis of the future." In some of the English textbooks on medicine and disease of the heart, written with not quite such a provincial or insular view as Mackenzie's, plain and forceful consideration is given to cardiac muscular insufficiency. What we feel like protesting against is not the view, nor its promulgation, but the assumption that it is the

position of very few. We wonder if Mackenzie is in touch with the younger men of Great Britain and other countries. Furthermore, if physicians have been trying by various tests to estimate the efficiency of the heart muscle, whether those tests be instrumental or by an interpretation of symptoms, whether the tests are trustworthy or not—and we agree with Mackenzie that they have had little value—is it not clear that this effort to find out the heart's efficiency implies a recognition of the importance of muscular function, no matter whether the lack of such function be viewed as due primarily to a valvular defect, to the result of back pressure, to a break of compensation, or whether it be said to be due to heart failure?

We feel life resenting the imputation that the great mass of clinicians and students do not understand even the elementary facts concerning prognosis or treatment of heart disease, and that they cannot, even when they are shown and told about it, appreciate the significance of presystolic and diastolic murmurs in mitral stenosis (p. 166). The personality of the speaker, if he were addressing a group of practitioners, might strip his words of their seeming offense against good taste; but in cold type they seem, every once in a while, to obtrude a self-assured superiority which, to speak mildly, is irritating rather than stimulating. This is unfortunate, for the book is so full of excellent things that it is a pity to have the total effect anything but good. It is profitable occasionally to have an iconoclast like Mackenzie come along and ruthlessly tear down our cherished idols. It is good to have the truth fearlessly spoken, though we may blush at our previous ignorance. We are glad to hear the Nauheim treatment condemned as essentially quackish. It is refreshing to hear his voice call us back to our senses in the matter of blood pressure and to the extravagance of many of the views regarding its dangers, amenability to treatment, etc. His references to the importance of symptoms, as contrasted with the findings of instrumental and physical examinations, are timely. His remarks on the taking of the history of the patient and the making of a prognosis, with its element of the unknown and the mysterious, could be written only by one who has had the experience of the general practitioner, and who has learned by this experience how to handle people, how to elicit from them the telltale symptoms of disease. His short discussion of treatment is full of more common sense as to diet, baths, use of digitalis, sedatives, etc., than many other articles of more pages than he has paragraphs. His discussion of cardiac irregularities is clear and authoritative, as one would expect from the physician whose pioneer work in this field did so much to clear the way for later investigators. One must agree with him as to the practical clinical importance of recognizing auricular fibrillation early because of its bearing on proper treatment; yet one feels that the last word concerning prognosis of extrasystole has not been uttered, and that there is still much that seems confusing as to auricular flutter and its relation to auricular fibrillation and paroxysmal tachycardia.

We might quibble with the author over his protest against the use of the term "pseudo-angina." We might contend that his statement that it is doubtful whether mitral incompetence itself ever constitutes a serious embarrassment to the heart (p. 104) is open to argument; we might still insist that the mechanical back pressure theory of cardiac pathology, with its compensation and decompensation, is a theory which will take more than Mackenzie's denial of its truth to destroy; we might show that even Mackenzie comes dangerously near to speaking in terms of back pressure once or twice, and that, after all, his "heart failure" and another man's "decompensation" or "muscular insufficiency" are essentially not very different; we might term his short description of septic endocarditis surprisingly incomplete and as seemingly missing the essential feature of the disease, that is, the sepsis, and mistakenly emphasizing the "profound depression of the heart muscle which is often the grave element," whereas the myocardial weakness in most cases is a feature well in the background; we might express the opinion that when he says that "only an infinitesimal number of those who suffer can ever hope to have the benefit of laboratory methods" he is overstating the fact and not taking into account that municipal, hospital and reliable private commercial laboratories are now quite numerous, and that not a few young graduates are progressive enough to have private laboratories of their own, or are acting as laboratory assistants to older general practitioners.

These, however, are minor matters. The book is excellent, though of an entirely different character from Mackenzie's larger work on "Diseases of the Heart," less sober, less dignified, less complete. But its purpose is different; it aims to stir up physicians to think about the principles underlying the recognition and treatment of heart disease, to speak plainly and forcibly about some of the notions wrongly fixed in the professional mind. It cannot help doing good. It is illuminating and stimulating in its simple, honest, rugged way of saying things.

ROENTGENOGRAPHIC DIAGNOSIS OF DENTAL INFECTION IN SYSTEMIC DISEASES. By Sinclair Tousey, A.M., M.D., Consulting Surgeon, St. Bartholomew's Clinic, New York. Cloth. Price, $1.00. Pp. 75, with 38 illustrations. New York: Paul B. Hoeber, 1916.

The illustrations in this little book are all reproductions of roentgenograms, most of them from films held inside the mouth at the time of exposure. A few are good; most of them do not show with sufficient definiteness to be convincing. There are no descriptions of the illustrations, except as they are mentioned in the text. The author gets far afield from his title in his endeavor to give the treatment of dental lesions, with the pathology of which he is apparently not very familiar. From the dental point of view, the nomenclature is of nearly a century ago. Several interesting case histories are given, accompanied by roentgenograms of the maxillary bones. These serve to emphasize the need of roentgenographic examinations of the mouth in all cases in which a focal infection might be causal. The book would have been of greater value had the author confined himself to his title and given accurate descriptions of the various illustrations, with complete histories of a larger number of cases.

Medicolegal

A Scheme and a Conspiracy to Defraud

(Hughes et al. vs. United States (U. S.), 231 Fed. R, 50)

The United States Circuit Court of Appeals, Fifth Circuit, affirms as to six, and reverses as to two of the defendants a conviction of conspiring to violate Section 215 of the penal code of the United States, which prohibits the use of the mails in the furtherance of schemes to defraud, and of violating that section, for which they were sentenced to terms of varying length in the penitentiary. The court says that it was contended by the demurring defendants that the counts of the indictment failed to show the devising of a scheme or artifice to defraud or for obtaining money or property by means of false or fraudulent representations or promises, in that it was not charged that the defendants were not qualified to administer the treatment they promised to administer, or that they did not, in fact, intend to administer such treatment, when paid therefor. It was true the indictment did not aver that the defendants were not so qualified, or that they promised with the then intention of not furnishing any treatment, though paid for so doing. The scheme relied on by the government was a different one. The fraud was alleged to have consisted in soliciting and receiving money from patients, intending to furnish medicine or treatment therefor, without regard to the needs of the patient for that or any treatment, without making any diagnosis such as would inform them as to the need of the patient for any or for what treatment, and with the intent to receive the money, though they knew that the patient paying it had no need of any treatment, or of the treatment to be furnished in consideration of it, or had purposely refrained from informing themselves of his needs in those respects. In other words, the indictment charged the defendants with having devised a scheme to solicit money from patients for promised

treatment, not intending to furnish treatment in good faith, but only as a pretext for securing the patient's money. Whether the treatment or medicine furnished was of little or much value intrinsically, in this view of the scheme, was of no consequence. The court thinks the scheme alleged to have been devised by the defendants was one included within and prohibited by Section 215. Five of the defendants were shown by the government's evidence to have been physicians and principals in the business that was being conducted at the two locations mentioned as the seats of the conspiracy, and the jury was authorized to infer from the evidence that these defendants were responsible during the period covered by the years 1912 and 1913 for whatever was being done on the premises at each location, and that they shared or were to share in the profits of the transactions, knowing their actual character. It was also open to the jury to infer from the evidence that the purpose of the business that was being conducted during the period mentioned, at those places, was not the bona fide treatment of disease, but a scheme to secure money from patients, with no purpose to treat them in good faith as promised, but merely as a pretext for taking the money solicited. The correspondence between the inspectors and the defendants, introduced in evidence, was of a character which justified the jury in drawing the inference of bad faith and fraud, if they saw fit. The fact that only fictitious transactions, based on decoy letters written by inspectors, were in evidence, and that no money was shown to have been received by the defendants, did not prevent the jury from inferring the existence of the conspiracy charged in the first count or the fraudulent scheme charged in the remaining three. As to another defendant, being himself a physician, the jury was authorized to infer that he could not have been associated with the principal defendants in the conduct of the enterprise, as shown by the record, without having become acquainted with its illegitimate character. If he participated in it in any way with knowledge of its character, he would be guilty of the offenses charged. The distinction between the other two defendants and these was that the other two were not shown to have acted in their own interest and for their own benefit, but as agents of the other defendants, and were not shown to have had the medical knowledge that would have authorized the jury to infer that what they did as agents they did with that consciousness of wrongdoing which would be essential to make them co-conspirators with the other defendants.

Time for Which Seaman May Charge for Cure

(The Bouker No. 2 (U. S.), 231 Fed. R. 254)

The United States District Court, Southern District of New York, says that the question whether a seaman who falls sick or is injured while on his voyage may charge for his cure only till the end of the voyage or whether his cure covers a reasonable period thereafter is not settled by any authoritative decisions. Mr. Justice Story, however, held that the cure extended beyond the voyage (*Reed* vs. *Canfield*, 1 Sumner, 195, Fed. Cas. No. 11,641), and his is a high authority in matters maritime. Judge Addison Brown, likewise a high authority in such cases, ruled the same way (The W. L. White (D. C.) 25 Fed. 503), and this has been followed in *Wilson* vs. *Manhattan Canning Co.* (D. C.) 205 Fed. 996, by Judge Cushman, and in The Lizzie Frank (D. C.) 31 Fed. 477, by Judge Toulmin. Judge Ward, in The Bunker Hill (D. C.) 198 Fed. 587, obiter, seems to have approved the rule, as did also Judge Hoffman in *Raymond* vs. *The Ella S. Thayer* (D. C.) 40 Fed. 902. Judge Henry B. Brown's decision in The J. F. Card (D. C.) 43 Fed. 92, proceeded rather on the fear of danger to shipping than on a consideration of the authorities. Judge Betts appears twice to have ruled against the right to cure after termination of the voyage (*Nevitt* vs. *Clarke*, Fed. Cas. No. 10,138, and The Atlantic, Fed. Cas. No. 620), but those were each earlier cases than the W. L. White, cited above. Similarly Judge Ross ruled for the ship in The Tamerlane (D. C.) 47 Fed. 822, and Judge Miller in The Ben Flint, Fed. Cas. No. 1,299. In this district it seems clear that the later cases are in accord with the libelant's position. Moreover, the cases to the contrary were all decided at a time when general notions of what was just in such matters favored the libelant much less than at present. Certainly this court should not have the right to change a well settled rule because it did not answer present convictions, but when the matter is open and inclines toward such convictions, it would be wrong to twist it back again. The libelant may recover the expenses of his cure and maintenance as proved, $1,091.90. No costs.

Rat-Proofing Ordinance Upheld

(City of New Orleans vs. Beck (La.), 71 So. R. 883)

The Supreme Court of Louisiana holds Ordinance 2512, commission council series, of the city of New Orleans, providing for the rat-proofing of all buildings and structures, etc., in said city, for the purpose of better preventing the introduction and spread of bubonic plague, to be a constitutional and valid exercise of the police power of the state in the interest of the health of the people. The court says that this is a new ordinance, adopted after the decision in Sanford's Case (137 La. 628, 69 So. R. 35, and briefly reported in THE JOURNAL, May 20, 1916, p. 1653), and intended to conform to the views expressed in the opinion in that case. If a board of health has the power to order the vacation or demolition of any building, when necessary for the protection of the public health, it surely possesses the lesser power to order any building to be put in such a condition as to prevent its becoming a focus of plague infection. The law makes the board of health the judge of the necessity for the protection of the public health, and of the means to be adopted for that purpose. That the bubonic plague prevailed in this city during the summer and fall of the year 1914 cannot be disputed.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, New York, Dec. 27-29.
American Physiological Society, New York, Dec. 28-30.
Medical Association of the Isthmian Canal Zone, Ancon, Dec. 16.
Society of American Bacteriologists, New Haven, Conn., Dec. 26.
Western Surgical Association, St. Paul, Dec. 15-16.

THE PHILADELPHIA COUNTY MEDICAL SOCIETY

Meeting held November 8, 1916

The President, DR. JOHN D. MCLEAN, in the Chair

The Recent Epidemic of Poliomyelitis in Philadelphia and Vicinity

DR. C. K. MILLS: I believe the occurrence of so-called abortive cases has been both overestimated and underestimated by writers contending for particular theories; they represent, possibly, a number equal to about 20 per cent. of the paralytic cases. Multiple cases of the disease occurring in the same family within a few days of each other argue in favor of simultaneous infection rather than contagion. Our studies indicate that the primary hosts and carriers of the disease are animals other than man. Some minute parasite like the mite may be the primary host of the protozoan of poliomyelitis. It is my conviction that the disease is humanly contagious in a comparatively mild or moderate degree. Most of the arguments adduced in favor of the theory of human contagion may be used in defense of the insectile theory of causation. During the present epidemic I have not been able to find any evidence of transmission of the disease to a healthy child or adult by a nurse, attendant or doctor in contact with cases of poliomyelitis. The occasional occurrence of epidemics of the disease in northern latitudes in the winter is probably the strongest argument against the insectile theory of causation. Most important arguments in favor of the entomologic origin of the disease are its vastly greater incidence in summer than

at other seasons; its occurrence in houses and neighborhoods which are insanitary and insectile, and the manner in which the disease tends to crop up in isolated rural localities. Notwithstanding the arguments against human contagion I do not exclude the necessity of quarantine properly conducted. I am inclined to take issue with Flexner that "The measures which we seek to put into effect against the introduction and spread of epidemic poliomyelitis should be based on the conception of the personal factor as paramount, and not on the notion of insect carriage." I believe that that which is most necessary is the cleaning up of the localities in which the disease occurs or is likely to occur. Poliomyelitis will sooner or later recur and perhaps with greater virulence unless strong measures are taken to improve housing and sanitation.

Special Clinical Studies of the Epidemic

DR. THEODORE H. WEISENBURG: In our investigation of infantile paralysis we found a marked uniformity in the initial symptoms. The paralysis, as a rule, appeared about the third day. Its severity was very great. Mostly either two or three limbs were involved and in many cases the chest and abdomen. The paralysis usually reached its height in a few hours. The mildest cases often developed the severest infection while a very sick child might have only limited paralysis. In the return of power to the limbs the distal portions recovered first. There were a number of cases with difficulty in talking and swallowing in conjunction with paralysis of the limbs or neck. There were an unusual number with paralysis of one side of the body. The most fatal cases were the so-called ascending and descending or the Landry types. There were an unusual number of adults in whom the paralysis was much more marked and recovery much slower than in children. Not many colored children had the disease, and in those affected recovery of power was much slower than in the whites. There was only one case in which a second attack occurred, thirteen years after the first. With the exception of a few instances multiple and abortive types occurred either at the same time or nearly so, pointing rather to a similar than contagious origin. Lumbar puncture performed early and repeated gives the best results in treatment. In every instance there was an increased amount of cerebrospinal fluid. Almost without exception marked relief from pain in head, neck and limbs followed this treatment. In some cases in which lumbar puncture was done before the appearance of the paralysis there was subsequently absence of headache and rigidity and pain of the limbs. None of the chemical forms of treatment have been of value, nor have I observed benefit from the use of the serum treatment.

A Summary of Laboratory Studies in Acute Anterior Poliomyelitis

DR. JOHN A. KOLMER: The causative microparasite appears to locate first in the pia mater, producing a form of meningitis, from which the infection spreads into the substance of the spinal cord with involvement and destruction of motor cells and possibly of those cells controlling respiration and action of the heart. It also has a tendency to locate in lymphoid tissues of the body. The changes produced in the intestine are similar to those found early in typhoid and other infectious diseases. An increase of the number of cells in the cerebrospinal fluid was found more constant in this disease than any other change and this finding has proved of more value in the diagnosis than any other laboratory examination. A perfectly clear fluid which flows under increased pressure and shows an increase of cells with or without a slight reaction for protein indicates anterior poliomyelitis. No unusual or peculiar types of cell were found. Very early in our investigations we found micro-organisms in the cerebrospinal fluids, brains and spinal cords of cases of poliomyelitis similar to those recently reported by physicians in Chicago and New York as the cause of the disease. Several investigators reported finding these bacteria in poliomyelitis as far back as 1905 but did not regard them as the cause of the disease. Our researches leave no doubt that these bacteria are to be found in the organs and possibly in the cerebrospinal fluid of persons suffering with poliomyelitis. They do not, however, produce the disease in the lower animals and are of secondary importance. We are engaged at present in efforts to grow the germ of poliomyelitis in rabbits, and with hopeful results, with the purpose of carrying out experiments bearing on the treatment of the disease with specific drugs and chemicals. I believe that the evidence indicates that acute epidemic poliomyelitis is a bacterial infection. Arsenobenzol, which is of proven value as a destroyer of protozoa, has no influence on this disease.

The Possible Etiologic Relations of Certain Insects to the Spread of Infantile Paralysis

MR. JOSEPH H. BODINE: A study of previous epidemics and the present one of poliomyelitis point to possible insect transmission of the disease. This is evidenced in the sporadic occurrence of the disease, its biennial recurrence, rural nature; the fact that only one or two people in the same household in actual contact contract the disease, the occurrence of most cases where the number of animals relative to the number of people is largest, and the fact that cases show a seasonable distribution to a greater degree than might be expected in contact infection. Experiments prove that the virus of poliomyelitis can be carried externally and internally in an active state by many varieties of insects. In thirty-eight or more diseases insects are known to play important rôles as disseminators, intermediate hosts and transmittors of disease. The chief reason for considering the tick in the study of poliomyelitis is the biennial occurrence of the disease—the tick requiring two years to mature. The possible connection of the mosquito with poliomyelitis is suggested by its presence in every locality thus far studied in the present investigation; the seasonal distribution of the disease, and the small percentage of mosquitoes infected in such diseases as malaria, thus accounting for the sporadic occurrence of the disease. The stable fly, resembling in blood-sucking habits the African species, was found in almost every neighborhood visited in the present investigation. The reasons for regarding the stable fly as a possible transmittor of poliomyelitis, as suggested by Rosenau, were the blood-sucking habits of the adult fly, the seasonal abundance of the fly closely correlating the incidence of the disease, the geographic distribution of the fly, which is wide or at least coextensive with poliomyelitis, its abundance under rural as well as urban conditions, that flies followed horses along lines of travel and that in many instances children were infected who had frequented places where the stable fly was found.

AMERICAN ASSOCIATION FOR STUDY AND PREVENTION OF INFANT MORTALITY

Seventh Annual Meeting, Held in Milwaukee, Oct. 19-21, 1916

(*Concluded from page 1787*)

After-Care of Victims of Infantile Paralysis

DR. HENRY L. COIT, Newark, N. J.: The Newark plan for the after-care of victims of infantile paralysis grew out of private initiative and the voluntary gift of $200 by a citizen. The interest of a local newspaper was enlisted, and it at once opened a campaign for a fund which increased rapidly, and which now approaches the $25,000 asked for. The mayor followed with the appointment of a "Citizens' Infantile Paralysis Relief Committee" which worked with the department of health. The committee also had the cooperation of various philanthropic organizations. The committee began its work with each case as soon as quarantine was lifted. The plan included the investigation of the home conditions of each case reported, with follow-up work by trained nurses under the direction of the committee. A pamphlet on the prevention and after-care of the disease was prepared, and 100,000 copies, printed in five languages, were issued. One or more after-care clinics were held by the health department daily, and provision for the after-care of patients who could not be treated at home was made by the local hospitals.

DISCUSSION

DR. HENRY M. BRACKEN, St. Paul: In Minnesota we followed every reported case, not taking the diagnosis of the physician or the person reporting, but determining for ourselves whether or not we considered the case a positive one, and so far we have not found a single case that has been traceable to infection from New York City. A quarantine of the entire family is sometimes required. Minnesota required the isolation of the patient and the attendant, and the protection of the room from flies by screening. The problem with which we are confronted is not simply that of preventing others from coming in contact with the infection, but also of recognizing the nonparalyzed cases as well as the paralyzed. We accepted the isolation period of six weeks, and also the two weeks' requirements for supervision or observation of persons who had been closely associated with patients. We have not turned the patients off when they have recovered from the acute symptoms, but arranged that one of the orthopedists of the state and his assistants should follow up every paralyzed case in the state, and we have records of all of them. We expect the parents or guardians of those who are paralyzed to be instructed as to what treatment should be given, if they are able to provide it themselves. If they are not, we expect the child to be turned over to the state hospital for crippled children, where it will be given ideal care. We look on that as part of the public health work. We do not believe that the obligation of the state board of health stops with the release of a patient from quarantine, but that it is our duty to put the individual back in the community in as good condition as possible.

DR. A. J. MCLAUGHLIN, Boston: There is an infantile paralysis commission at Harvard, which we have made our agents without pay. They are doing research work, and have charge of the after-care of the crippled children.

DR. C. A. HARPER, Madison, Wis.: The noticeable condition at the present time is that the area affected in 1909 has been practically free from the disease this year. We are endeavoring to get into communication with every case that occurs; all cases are recorded and reported to the central office by telephone or telegram. We have not yet adopted any plan for taking care of those crippled as a result of the disease; but we have in conjunction with one of our state institutions an institution in which cripples belonging to the state may go and receive state aid.

DR. WILMER R. BATT, Harrisburg, Pa.: Poliomyelitis was made reportable in Pennsylvania in 1910. The alarming conditions reported from New York this year prompted the commissioner of health and the advisory board to make the disease quarantinable. The quarantine implied absolute isolation, with guards, if necessary, and disinfection, as in the graver communicable diseases. A border quarantine was established. There were 119 quarantine points covered by 318 guards. In addition the health officers were advised to be on the alert for indication of any case. We are using the same methods of after-care as are being followed elsewhere, trying to reduce the effects by securing orthopedic treatment for the children.

DR. JOHN S. FULTON, Baltimore: I think all we need in lieu of all this expensive board of quarantine is notification. Our experience in Baltimore shows that we can and did get notification which enabled us to take the precautions we thought we had a right to take and ought to be expected to take. We must assume on the part of each state, that contacts are taken care of and that the cases are properly isolated. Why, then, should we concern ourselves so tremendously with the remaining part of the population? I do not think we need to do so. A notification of the movements of children under 16 ought to be satisfactory. If there had been such notification from every infected area it would have been satisfactory to us instead of the numerous manifestations in the way of restrictive quarantine.

DR. S. JOSEPHINE BAKER, New York: Is it not possible that at least some of this high death rate from infantile paralysis is due to the fact that we have practiced an extreme hospitalization in this disease? In New York City for the first nine months of the year there were 1,022 fewer deaths under 1 year of age than last year. This reduction has been most interesting, because during the year we have encountered every condition which we have been avoiding and fighting for ten years—mothers of babies all staying in town, fresh air agencies closed down, mothers keeping babies in almost hermetically sealed houses, disinclination on the part of the mothers to take their babies to the infant welfare stations or to take them out at all; but we have had one thing we have never had before—an almost universally receptive state of mind on the part of the mothers as to the teaching of infant care. They have come to us almost begging for instruction, and the result has been such that the general health of babies has been infinitely better than for many years, and this year we shall probably have the lowest death rate in years.

DR. WILBUR A. SAWYER, Sacramento, Calif.: We found it a disadvantage to have the cards sent out, as they were originally, directly to the health department, instead of to the local health officers. We felt that the local health officer should be notified as early as possible that the patient was arriving in his city. There was another disadvantage in the fact that the recommendations drawn up in Washington had a sixteen year limit. All the evidence inclines to show that the adult is at least equally responsible with the child. Therefore, in our own regulations we have ignored that 16 year old requirement, and required notification from all people entering California from any infected territory.

DR. J. H. MASON KNOX, Baltimore: The only way to combat a disease that is epidemic in character and that may be spread through interstate travel is through federal control. If, instead of giving opportunity to all this interstate rivalry, one state doing one thing and another doing something else, the control of the epidemic had been put up to the United States government, we should have had some uniformity in the method. I hope that later on, as in the case of yellow fever, for instance, we shall come to see the absurdity of such a situation as we have had this year, and place the matter entirely in the hands of the United States Public Health Service.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, Boston

November, VI, No. 11

1 Some Important Public Health Problems. J. F. Anderson, New Brunswick, N. J.—p. 1139.
2 Occurrence of Living Tubercle Bacilli in River Water Contaminated by Sewage from Health Resort. L. Brown, S. A. Petroff and F. H. Heise, Saranac Lake, N. Y.—p. 1148.
3 Standards of Mechanical Filtration Plant Performance. A. Wolman, Baltimore.—p. 1153.
4 Tuberculosis Among Prostitutes: Report of an Investigation in Connection with Study of Disease in Cincinnati, Ohio. D. E. Robinson and J. G. Wilson, Washington, D. C.—p. 1164.
5 Study of Prevalence of Bacillus Coli in Some Tropical Surface Waters, with Special Reference to Surface Waters of Panama and Some Waters of Mexico. J. T. B. Bowles, New York. —p. 1173.
6 Relation of Housing to Public Health Movement. L. Veiller, New York.—p. 1179.
7 Rural Sewage Problem. E. G. Williams, Richmond, Va.—p. 1184.
8 Proposed Bureau of Industrial Safety, Sanitation and Hygiene, to Be Maintained on Mutual Plan. C. D. Selby, Toledo, Ohio. —p. 1187.
9 Use of Life Tables in Public Health Work. M. M. Dawson, New York.—p. 1190.
10 Value of Isolation Hospitals for Small Cities. C. S. Caverly, Rutland, Vt.—p. 1196.
11 Public Health Work Through Press in North Carolina. W. H. Booker.—p. 1201.
12 Urban and Rural Control of Fly Problem. L. M. McCormick, Asheville, N. C.—p. 1206.
13 Sewage Digestion Tanks for Small Towns and Cities. G. E. Hill, New York.—p. 1212.
14 Activated Sludge. W. T. Carpenter and M. P. Horowitz, Brooklyn.—p. 1218.
15 Some Results of Treatment of Baltimore Drinking Water by Calcium Hypochlorite. W. R. Stokes, and F. W. Hachtel, Baltimore.—p. 1224.

California State Journal of Medicine, San Francisco

November, XIV, No. 11

16 Cooperative Medicine in Relation to Social Insurance. J. L. Whitney, San Francisco.—p. 432.
17 Should Medical Profession Plead in Favor of Proposed Health Insurance Bill? J. H. Graves, San Francisco.—p. 439.
18 Proposed Social Health Insurance Act. D. M. Gedge, San Francisco.—p. 446.
19 Abortion, and Some Suggestions How to Lessen Criminal Abortions. O. H. Beckman, Fort Bragg.—p. 447.
20 Serodiagnosis of Gonorrhea. M. Krotoszyner, San Francisco.—p. 451.
21 Septic Teeth. J. S. Marshall, U. S. Army.—p. 454.

Canadian Medical Association Journal, Toronto

November, VI, No. 11

22 Epidemic Cerebrospinal Meningitis. A. G. Nicholls, Halifax, N. S.—p. 969.
23 Clinical Pathology of Cerebrospinal Fluid. W. Boyd, Winnipeg.—p. 984.
24 Cases of Syphilis of Eye Following Treatment by Salvarsan. S. H. McKee and H. D. Courtenay.—p. 996.
25 Mode of Origin of Homologous Twin Pregnancy and Its Bearing on Cell Theory. J. Cameron, Halifax.—p. 998.
26 Diagnosis and Surgical Treatment of Gastric and Duodenal Ulcer. J. K. McGregor, Hamilton.—p. 1003.
27 Cases of Primary and Secondary Syphilis. A. W. Bagnall.—p. 1008.

Colorado Medicine, Denver

November, XIII, No. 11

28 Congenital Pyloric Stenosis. J. G. Binnie, Kansas City, Mo.—p. 330.
29 Postural Prophylaxis in Relation to Deformity. A. J. Hosmer, Salt Lake City.—p. 335.
30 *Surgical Observations of Chronic Frontal Sinusitis and Its Complications. D. A. Vanderhoof, Colorado Springs.—p. 340.
31 Public School Medical Inspection in Small Cities. W. S. Duhoff, Greeley.—p. 345.

30. Surgical Observations of Chronic Frontal Sinusitis.—Vanderhoof says that transillumination has proved of very little value in connection with diseases of the frontal sinus. The Roentgen ray, though it does not always demonstrate a diseased sinus, does show the shape and size, and no frontal sinus operation should be attempted without first having roentgenograms made. Acute suppurative conditions of the nose should be looked after early, as this would do away with many chronic infections of the frontal sinuses, but when they do occur and it is necessary to resort to operative procedure, first be sure that all diseased ethmoid cells are removed before attempting any work on the frontal.

Indiana State Medical Association Journal, Fort Wayne

October, IX, No. 10

32 Contribution of Animal Experimentation to Internal Medicine. H. A. Christian, Boston.—p. 407.
33 Suppression and Control of Degeneracy. T. H. Davis, Richmond.—p. 412.
34 Dermatitis Induced by Druggist. M. L. Heidingsfeld, Cincinnati.—p. 414.

November, No. 11

35 Medical Activities in Indiana. G. F. Keiper, Lafayette.—p. 439.
36 *Military Surgery. J. R. Eastman, Vienna, Austria.—p. 445.
37 Physician as Community Asset. L. B. Nusbaum, Richmond.—p. 447.
38 Family Spastic Paraplegia. E. M. Auer, Indianapolis.—p. 450.

36. Military Surgery.—The *Zinkleimverband* (zinc glue dressing), a modification of the Unna paint boot, Eastman says, is useful in ambulant cases of fresh wounds with granulating surfaces of the leg. It combines the antiseptic wound treatment with an elastic support. It is made of phenol 2 parts; zinc oxid; gelatin; glycerin and water each 300 parts. The leg is encased in a gauze bandage impregnated with this zinc glue.

Journal of Experimental Medicine, Baltimore

December, XXIV, No. 6

39 *Interrelation of Surviving Heart and Pancreas of Dog in Sugar Metabolism. A. H. Clark, Baltimore.—p. 621.
40 *Epidemiology of Lobar Pneumonia. E. G. Stillman, New York.—p. 651.
41 *Various Factors in Respiration in Persons with Pneumothorax. J. H. Means and G. M. Balboni, Boston.—p. 671.
42 *Comparative Resistance of Bacteria and Human Tissue Cells to Certain Common Antiseptics. R. A. Lambert, New York.—p. 683.
43 Changes in Pigment Epithelium Cells and Iris Pigment Cells of Rana Pipiens Induced by Changes in Environmental Conditions. E. Uhlenhuth, New York.—p. 689.
44 *Separation of Serum into Coagulative and Noncoagulative Fractions. A. F. Hess, New York.—p. 701.
45 Influence of Certain Factors, Especially Emotional Disturbances, on Epinephrin Content of Suprarenals. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 709.
46 *Study of Experimental Nonhemolytic Streptococcus Lesions in Vitally Stained Rabbits. R. L. Cecil, New York.—p. 739.

39. Heart and Pancreas in Sugar Metabolism.—The experiments made by Clark indicate that the pancreas, when perfused aseptically with Locke's solution containing physiologic concentrations of dextrose, does not alter the reducing properties of the perfused solution. The pancreas, however, seems to supply something to the Locke's solution circulating through its arteries which in some way brings about a utilization of sugar by the living heart to an extent that does not occur with the heart alone. This pancreatic substance possesses some of the characteristics of an enzyme. It is inactivated by boiling; it is unstable, rapidly becoming inactive on standing; it acts in small amounts; it causes a great acceleration in the rate of a reaction which otherwise proceeds slowly, and the rate of reaction diminishes as the reaction proceeds. Thus this substance has more of the characteristics of an enzyme than of a stable internal secretion like that of the suprarenal glands. The disappearance of sugar was dependent on the presence of living heart tissue, and it ceased as soon as the perfusate was removed from the heart pancreas circulation and did not occur at all when a pancreatic perfusate was passed through a nonbeating heart. This result indicates that the reaction is not similar to that obtained when muscle and pancreas extracts act on more concentrated solutions of dextrose.

40. Epidemiology of Lobar Pneumonia.—During the past four years a careful study has been carried on by Stillman of the types of pneumococci isolated from cases of lobar pneumonia admitted to the wards of the hospital of the Rockefeller Institute. These organisms have been isolated from the sputum, blood, or lung directly, and in many instances from more than one of these sources, and classified according to the biologic groups previously described. It was found that pneumococci of Type 1 and Type 2 are responsible for the majority of the cases of lobar pneumonia. Among the pneumococci found in the mouths of healthy individuals, Type 4 predominates, Type 3 is fairly frequent, and atypical organisms of Type 2 are occasionally encountered. Organisms of these types give rise to a minority of cases of lobar pneumonia. Healthy persons intimately associated with cases of lobar pneumonia may harbor in their mouth secretions the highly parasitic pneumococci of Types 1 and 2. Occasionally a carrier of Type 1 and Type 2 pneumococcus is encountered in whom it is impossible to trace any contact with an infected patient. Convalescents from lobar pneumonia may carry for a considerable period of time the type of pneumococcus with which they were infected.

41. Factors of Respiration in Pneumothorax.—The only difference between normal persons and persons with a collapsed lung according to Means and Balboni is that the latter when called on to increase their ventilation reach their limit a little sooner than the former. There will be no dyspnea except after moderate exertion. This deduction is borne out by the histories of patients. In other words, in the lungs, as in other organs, there is a large factor of safety, one lung being as efficient as two, except when the work done calls for more than a threefold increase in the normal ventilation.

42. Resistance of Bacteria and Human Cells to Antiseptics.—In the case of the majority of chemicals used by Lambert (potassium cyanid, phenol, tricresol, hydrogen dioxid and alcohol) tissue cells were definitely more easily killed than were bacteria. With certain other disinfectants the difference was not so striking. In several experiments with mercuric chlorid it was noted that in a few preparations there was a slight growth of connective tissue cells after exposure for one hour to a dilution of 1:20,000 or 1:40,000, a strength sufficient to kill or markedly inhibit the growth of staphylococci under similar conditions. It was observed, however,

that the cells grew out from the centers of the tissue fragments, not appearing until after four to five days of incubation. It was concluded that growth in these cases was due simply to the low penetrating power of mercuric chlorid, for cultures in 1:80,000 never showed an active outgrowth of peripheral cells. Alcohol in the strengths used (5, 10, 20 and 50 per cent.) was found to be bactericidal in only the highest strength. On the other hand, it is noteworthy that human cells show no ill effects from exposure to 5 or 10 per cent. alcohol for one hour. Iodin stands out as the one chemical tested to which cells were found to be more resistant than were staphylococci. A good growth of cells was seen after exposure to a 1:2,000 solution of iodin for one hour, a strength sufficient to sterilize the tissue completely in most instances.

These experiments afford further experimental evidence of the value of iodin as an antiseptic, and indicate that, at least in weak aqueous solution, it should not, as is often stated, injure or irritate the tissues. It was observed, however, that iodin has the power of rapidly dissolving fibrin, a property, which, theoretically, should not be conducive to wound healing. A similar action by hypochlorites (Dakin's solution) was also noted. Although the wound cleansing property of the latter, which evidently depends on this fibrin-dissolving function, is favorably emphasized by Dakin, it would seem that the plastering together of wound surfaces by fibrin, which is thought to facilitate healing, would be prevented by the use on wounds of either iodin or the hypochlorites.

44. **Separation of Serum into Fractions.**—The method followed by Hess consists of diluting the serum with one half of its volume of water, and then precipitating the euglobulin with a 30 per cent. ammonium sulphate solution; a small amount of pseudoglobulin comes down in the course of the process. The ammonium salt is then added up to 54 per cent. to carry down the pseudoglobulin, after which enough is added to the filtrate to precipitate all the albumin. The addition of 1 or 2 drops of euglobulin hastened coagulation, whereas the same amount of the other proteins failed to bring about this result. This was the usual course of all experiments of this kind, although in some instances the differences did not stand out so sharply. In a case of hereditary hemophilia the euglobulin caused a marked shortening of the coagulation time, whereas the other fractions produced this effect to a less degree. When it was not desired to obtain the three protein fractions separately but only to precipitate the euglobulin from the serum, sodium chlorid was employed instead of ammonium sulphate. The method pursued was as follows: The serum was saturated in the cold with chemically pure crystals of sodium chlorid. It was then filtered, and a small amount of chloroform added to the precipitate, which was dialyzed for about a week. The dialysate was then taken up with Ringer's solution, and 0.3 per cent. of tricresol added. This was then filtered through a Berkefeld filter and bottled in 20 c.c. vials.

When a certain maximum is reached the addition of a large amount of euglobulin ceases to have any further effect; that, for example, the coagulation time may remain the same whether one adds a drop of a 1.25 per cent. solution or of a 2.5 per cent. solution of euglobulin to 5 drops of plasma. Euglobulin is able to hasten the clotting of plasma in purpura, another type of hemorrhagic disease. The fact that the coagulative principle is closely associated with the euglobulin fraction of the blood is of clinical as well as of theoretical interest. It enables one to prepare a hemostatic containing about 2 per cent. of protein which is more potent than the whole serum containing 6 to 7 per cent. of protein. When intravenous injections are resorted to, euglobulin seems to be preferable to serum which contains fully three times the quantity of protein. It also seems to be absorbed more quickly from the subcutaneous tissues.

46. **Nonhemolytic Streptococcus Lesions in Rabbits.**—Repeated injections into rabbits of nonhemolytic streptococci isolated from human cases of infectious endocarditis or rheumatic fever, Cecil says, will produce an acute arthritis in the rabbit similar in most respects to the arthritis of acute rheumatism. Microscopic sections of the joints show a gradual transition from an acute exudative inflammation to advanced organization. Endocarditis and pericarditis occur in a small percentage of cases, and focal lesions in the myocardium consisting of necrosis and the infiltration of cells are frequent. These focal lesions differ considerably from Aschoff's submiliary nodules. Lesions in the kidneys and liver occur but are not characteristic. By means of the vital stain it has been shown that the large endothelioid cells which play a prominent part in the joint and myocardial lesions belong to the group of so-called macrophages or wandering cells and probably develop from the vascular endothelium.

Journal of Infectious Diseases, Chicago

December, XIX, No. 6

47 *Effect of Toluene on Production of Antibodies. L. Hektoen, Chicago.—p. 737.
48 *Anaphylactic Shock in Dogs. J. P. Simonds, Chicago.—p. 746.
49 *Necessity of Standard Blood Agar Plate for Determination of Hemolysis by Streptococci. W. C. Becker, Chicago.—p. 754.
50 *Agglutination and Cultural Relationship of Members of So-Called Streptococcus Viridans Group. C. Krumwiede, Jr., and E. L. Valentine, New York.—p. 760.
51 Streptothrix in Bronchopneumonia of Rats Similar to That in Rat-Bite Fever. R. Tunnicliff, Chicago.—p. 767.
52 Acid Production and Other Characters of Bacillus Coli-Like Bacteria from Feces and Sewage. M. Levine, Ames, Iowa.—p. 773.
53 Relationship Between Serum Reactions. H. Wehrbein, Ames, Iowa.—p. 806.
54 *Etiology of Typhus Exanthematicus in Mexico (Tabardillo). P. K. Olitsky, B. S. Denzer and C. E. Husk, New York.—p. 811.
55 Relation of Specific Precipitation to Other Immunity Reactions. H. A. Bulger, Columbus.—p. 832.

47. **Toluene and Production of Antibodies.**—The results of Hektoen's experiments indicate that in rabbits the effect of toluene in repeated doses of about 1 c.c. per kilogram of weight is to diminish the output of antibody in the earlier periods of antibody production, and, under certain conditions, to cause prolonged persistence of antibody in the blood, with, in at least some cases, marked fluctuations in the concentration. Increased persistence of antibody in the blood may follow smaller doses of toluene also. There is no immediate change as to number and proportion of leukocytes in the blood of rabbits treated with toluene as here described, nor is there any change in the phagocytic activity of the leukocytes in vitro. In rabbits receiving the larger doses of toluene there occurs a transitory myeloid hyperplasia in the bone marrow, but later no marked changes in the marrow or other organs appear. On this account there is at present no basis for concluding whether the fluctuation and persistence of antibodies in the blood is better explained as resulting from increased and prolonged production of antibodies, or as resulting from interferences with the passage of antibodies out of the blood.

48. **Anaphylactic Shock in Dogs.**—Anaphylactic shock in the dog, Simonds states, is associated with a fall in blood pressure. During the period of low pressure the reaction to injections of epinephrin is either absent or greatly diminished, while the response to nicotin may be augmented. It is believed that the mechanism of the latter is chiefly dependent on its effect on respiration, and only to a very limited extent or not at all on direct stimulation of the vasomotor center or the sympathetic ganglia. There is evidence for the belief that there is present a condition of decreased irritability of the sympathetic ganglia and possibly of the vasomotor center. The prompt rise in arterial pressure after injections of nicotin associated with dyspnea is evidence that in anaphylactic shock in the dog there is no constriction of the vessels of the lungs.

49. **Standard Blood Agar Plate to Determine Streptococcic Hemolysis.**—The following technic for the preparation of a standard blood agar is suggested by Becker: Standard agar used in water analysis is placed in quantities of from 40 to 100 c.c. in flasks. These are heated until the agar is melted, and then cooled to 45-50 C. One cubic centimeter of defibrinated human blood is added for each 6 c.c. of the agar base and the whole thoroughly mixed. Approximately 7 c.c. are used for each plate. Surface streaks are made and results noted after twenty-four hours' incubation at 37 C. On such

plates, strains of streptococci, pneumococci and gonococci can usually be readily grown and distinguished.

50. **Streptococcus Viridans Group.**—Streptococci of the "viridans" type isolated by Krumwiede and Valentine from pathologic conditions apparently constitute a heterogeneous group. Saprophytic types may show some relationship one to the other, but practically none to the pathogenic type. Therapy, serum or vaccine, to elicit specific results is therefore possible only with autogenous strains.

54. **Etiology of Mexican Typhus (Tabardillo).**—The data presented by the authors as bearing on the etiologic relationship between this organism and Mexican typhus may be summarized as follows: Of eleven cases cultured, nine were positive. Of these eleven, three were cultured in 0.5 per cent. glucose serum agar; one was positive. Eight of the eleven were cultured in 2 per cent. glucose serum agar; all these were positive. At the same time and by the same methods, blood cultures taken on control cases were negative. The bacteria were more numerous in the early stages of the infection and in the more severe cases. The organism obtained is identical in all its features, especially in carbohydrate fermentation and in its serum reactions, with the typhus bacillus isolated in New York from cases of endemic and epidemic forms of the disease. The blood so cultured was true typhus virus; the authors were able to infect guinea-pigs with typhus by the injection of such blood. In animal experiments with infected lice, they have been able to produce the disease in guinea-pigs when a sufficient number of lice were injected. From the spleen of one of these animals numerous colonies of the same bacillus were obtained.

Kansas Medical Society Journal, Topeka

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56 Differentiation in Mental Cases. C. B. Burr, Flint, Mich.—p. 311.
57 Chemistry as Essential of Medicine. P. S. Mitchell, Iola.—p. 318.
58 Sexual Neurasthenia.—G. C. Mahaffy, Ottawa.—p. 323.
59 Human Actinomycosis; Report of Case. M. T. Sudler, Rosedale. —p. 326.
60 Fat Content of Bottom Milk as Affected by Temperature and Period of Pasteurization. H. C. Berger, Kansas City.—p. 329.

Laryngoscope, St. Louis

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61 Sudden Death During Bronchoscopy; Physiologic Study. C. J. Imperatori, New York.—p. 1257.
62 *Relation of Air Pressure in Nose to Ear Disease. J. W. Durkee, Brooklyn.—p. 1268.
63 Conduction Aphasia in Case of Brain Abscess. E. Amberg, Detroit. —p. 1275.
64 Double Cavernous Sinus Thrombophlebitis Secondary to Middle Ear Infection without Involvement of Mastoid or Other Venous Sinuses. C. G. Crane, Brooklyn.—p. 1283.
65 Double Cavernous Sinus Thrombosis Following Obscure Mastoiditis. W. T. Patton, New Orleans.—p. 1296.
66 Extensive Cholesteatoma Following Luc-Caldwell and Killian Operations Simulating Sarcoma. V. Dabney, Washington, D. C. —p. 1302.

62. **Air Pressure and Ear Disease.**—From his investigations, Durkee concludes that, in cases in which there is nasal obstruction, the negative air pressure in the nose and nasopharynx during inspiration, with the mouth closed or open, or during the act of swallowing, is not to be considered a cause of ear disease.

Maine Medical Association Journal, Portland

November, VII, No. 4

67 Relation of Ophthalmology to General Medicine. J. E. Weeks, New York.—p. 105.
68 County Secretaries. J. A. Spalding, Portland.—p. 121.
69 Case of Spasmodic Stricture of Esophagus. Cardiospasm. R. F. Chase, Portland.—p. 127.

Medical Record, New York

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70 Latin and Ancient Greek for Modern Physicians. A. Jacobi, New York.—p. 927.
71 Diagnosis of Abdominal Distention in Children. L. Fischer, New York.—p. 932.
72 Management of Recent Epidemic of Poliomyelitis in New York City from Neurologist's Viewpoint. W. M. Leszynsky.—p. 934.
73 Theory as to Causation of Poliomyelitis. Negation of Glandular Efficiency. D. W. Wynkoop, Babylon.—p. 936.
74 Medicine in New York City in the Sixties. A. L. Sweet, Geneva. p. 938.
75 An Improved Instrument for Maintaining Oral Air-Way During General Anesthesia. J. E. Lumbard, New York.—p. 941.
76 Report of Committee on Industrial Hygiene of Retail Dry Goods Association. M. H. Kahn, New York.—p. 943.
77 Tetanus, Report of Successfully Treated Case. L. Sexton, New Orleans.—p. 945.
78 Gastric Aspirator. W. G. Morgan, Washington, D. C.—p. 947.

Military Surgeon, Washington, D. C.

November, XXXIX, No. 5

79 Hygiene and Sanitation on Ocean Vessels. V. G. Heiser, Washington, D. C.—p. 455.
80 Smoke and Powder Gases in Naval Warfare. D. N. Carpenter, U. S. Navy.—p. 461.
81 Typhus. H. C. Hall, U. S. Army.—p. 474.
82 Paratyphoid Infections. J. D. Whitham, U. S. Army.—p. 491.
83 Rôle of Orthopedic Surgery in Early Treatment of Injured and Wounded. E. W. Fiske, U. S. Army.—p. 497.
84 Prosthetic Appliances in War-Time. F. H. Garrison, U. S. Army. —p. 507.
85 Wing Support for Fractured Humerus. G. Gassette, Paris.—p. 510.
86 Fractures of Maxillaries. W. C. Speakman, Neuilly, France.— p. 514.
87 Extracts from Report on Observations and Experiments with Soldier's Foot at Plattsburg Camp for Business Men. H. D. Corbusier, New York.—p. 518.
88 Pitching and Striking Field Hospital in Record Time. W. W. Reno, U. S. Army.—p. 527.
89 Record March by Sanitary Troops. C. M. O'Connor, Jr., U. S. Army.—p. 531.

New Mexico Medical Journal, Las Cruces

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90 Suggestions to Life Insurance Examiners. C. A. Frank, Albuquerque.—p. 37.
91 Social Responsibility Arising from Medical Progress. W. G. Hope, Albuquerque.—p. 43.
92 Neglected Prostate; Report of Cases. E. L. Ward, Santa Fe.— p. 53.

New Orleans Medical and Surgical Journal

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93 Insect Transmission of Disease in Orient with Especial Reference to Experimental Conveyance of Trypanosoma Evansi. M. B. Mitzmain, Washington, D. C.—p. 416.
94 Tetanus; Report of Successfully Treated Case. L. Sexton, New Orleans.—p. 424.
95 *Unilateral Edema. S. C. Jamison, New Orleans.—p. 432.
96 *Blood Transfusion Simplified; Deductions from Nineteen Cases, Eleven Human and Eight on Dog. J. T. Nix, Jr., New Orleans. —p. 435.
97 Hysterectomy for Double Pyosalpingitis. L. Levy, New Orleans. —p. 443.
98 Conservative Treatment of Thrombo-Angeitis Obliterans. Foreign Body in Esophagus. U. Maes, New Orleans.—p. 449.
99 Unusually Large Cystic Appendix Vermiformis and Dermoid Cyst of Ovary, P. Michinard, New Orleans.—p. 454.
100 Recent Experience with Ipecac and Its Alkaloids in Treatment of Amebiasis. S. K. Simon, New Orleans.—p. 457.

95. **Unilateral Edema.**—Jamison calls attention to the fact that edema of one leg is certainly a common condition in his locality, while edema of one arm is rather rare. Jamison believes that edema of the arm is usually easily explained while edema of one leg is not. In his opinion edema of one leg is perhaps more frequent from obstruction to the lymphatics following infection of the genitals than from any other cause.

96. **Blood Transfusion Simplified.**—The method of A. O. Singleton is endorsed by Nix. Use is made of Kimpton Brown tubes, paraffin coated, and by means of wash bottles half filled with water established positive or negative pressure, during injection into recipient or aspiration from donor respectively. The first five human transfusions were by this method, 500 c.c. of blood being transfused in each case. The first two were on the same patient for splenic anemia, at one week's interval, the blood count being raised from 1,200,000 to 2,500,000. The patient's general condition improved wonderfully and the spleen was removed June 6, 1916. She has continued to improve and at present is in better condition than she has been for two years. In one instance the donor was a son and in the other a daughter; preliminary agglutination tests were negative. The next two transfusions were administered to a boy, 18 years old, suffering from a virulent type of bacteremia with infectious polyarthritis, following a suppurative mastoiditis. Within one week fever left entirely

and the patient was out of danger. The fifth case was one of puerperal septicemia of one month's duration, the temperature being septic and high. Five hundred cubic centimenters of blood were transfused from a younger sister and the patient made a rapid recovery.

The sixth and seventh cases were septic and 500 c.c. of blood were transfused in each instance. One patient was moribund at the time and died twenty-four hours after the transfusion; the other immediately responded to treatment and made a good recovery. Nix made special tips by drawing out small size drinking tubes, by heating in the flame of an alcohol lamp. There was a small swell near the small end of the tube over which the vein could be drawn and safely tied. To the other end was attached a small piece of rubber tubing. These tips could be easily inserted, filled with citrate, the rubber connection clamped with a nonserrated artery forceps, and the tip allowed to remain inserted as long as necessary. Nix has now devised a special instrument, consisting of two syringes, which is described fully.

New York Medical Journal

November 25, CIV, No. 22

101 After-Treatment of Infantile Paralysis. R. H. Sayre, New York.—p. 1029.
102 Epileptogenous Zones in Organic Epilepsy. A. Gordon, Philadelphia.—p. 1033.
103 Injuries to Spinal Cord Produced by Modern Warfare. C. B. Craig, New York.—p. 1035.
104 Treatment of Infantile Paralysis. H. W. Frauenthal, New York.—p. 1042.
105 Id. F. E. Peckham, Providence, R. I.—p. 1045.
106 Speedy Cure of Tuberculosis. J. D. Gibson, Denver.—p. 1047.
107 Health Insurance from Viewpoint of Physician. I. S. Wile, New York.—p. 1050.

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108 *Eczema in Infants and Young Children. C. G. Kerley, New York.—p. 523.
109 Intracranial Surgery and Its Relations to Ophthalmology. C. A. Elsberg, New York.—p. 526.
110 *Diagnosis and Clinical Characteristics of Gout. J. H. Pratt, Boston.—p. 531.
111 *Treatment of Gout. A. F. Chace, New York.—p. 537.
112 *Metabolism in Gout. N. B. Foster, Ann Arbor, Mich.—p. 539.
113 Determination of Uric Acid in Blood. M. S. Fine, New York.—p. 541.
114 Accidental Hemorrhage and Its Treatmeint. J. K. Quigley, Rochester.—p. 544.
115 Treatment of Procidentia Uteri. G. Chandler, Kingston.—p. 551.
116 *Renal Tuberculosis. H. D. Furniss, New York.—p. 553.
117 *Choice of Tuberculins. B. White, Otisville.—p. 556.
118 Recent Advances in Cancer Research. W. H. Woglom, New York.—p. 558.
119 Roentgenography of Sellaturcica and Pituitary Body. G. C. Johnston, Pittsburgh.—p. 559.

108. **Eczema in Infants and Children.**—In children past the bottle age, Kerley says: Skimmed milk, puddings made from skimmed milk, all the breadstuffs, all cereals but oatmeal, all vegetables, usually twice a day, chicken and butcher meat rarely should be given. Everything given is largely sugar-free. If there is constipation, a daily evacuation of the bowels is produced by magnesia or cascara. Among the drugs for internal administration, potassium citrate sufficient to neutralize the urine is most valuable. Kerley is in accord with any theory relating to a special constitutional state such as the exudative diathesis as necessary for eczema, for the following reasons: A combination of high butter fat, high sugar, orange juice and beef juice will produce an eczema in many children who never show the condition when normally fed. Further, eczema may be produced by many foods of widely varying types. How dissimilar are orange juice, cow's milk fat and beef juice and sugar? Not every child, however, will react to all of these foods. The one may respond to beef juice but will tolerate milk. Another will react to cane sugar, but show no response to orange juice. The so-called exudate diathesis or exudative condition with exudative symptoms may be produced at will by the administration of certain food substances in a great majority of children. One reason for the frequency of eczema in children is because the child is unable to adjust itself to the many varieties of food and food elements which are given him, whether natural or artificial.

110. **Diagnosis of Gout.**—The term chronic gout is restricted by Pratt to those cases in which the attacks are frequent and deformity or rigidity of the joints occurs. The signs of acute inflammation are less than in the acute disease, but the duration of symptoms is longer. In fact, suffering and disability may be constant. In chronic gout chalk stones are apt to form. They are not found in any other disease. Although the most common site is the helix of the ear, they are often observed on the fingers and toes. A microscopic examination of material from nodules thought to be tophi should always be made. The beautiful acicular crystals of sodium urate are easily demonstrated. The frequency with which sodium urate is deposited in the olecranon and prepatellar bursae is not generally recognized. Inflammation of these bursae is almost pathognomonic of gout. In many cases the olecranon bursa on each elbow becomes converted into a hard rounded mass several centimeters in size. The sweetbread meal has proved of aid in diagnosis. The patient is placed on a purin-free diet, and the daily output of uric acid in the urine determined. After having been on this diet for at least four days the blood is analyzed for uric acid and 150 to 300 gm. of sweetbread (weighed raw) are fed. The purin-free diet is then resumed. The blood of a gouty subject forty-eight to seventy-two hours after the sweetbread meal has shown, in the few cases examined, an abnormally high amount of uric acid, while in control subjects this was not found. The prompt relief from pain produced by colchicum in gout is so striking that many have asserted that this drug is a specific in gout. It is certainly an aid in diagnosis, as colchicum does not relieve the pain in acute rheumatism or in other conditions which may be confounded with gout. Salicylates rarely have any marked effect in controlling the pain of acute gout. The relief of the severe pain of gout by atophan is even more striking than that produced by colchicum. Its value in diagnosis is probably less, as it often is of considerable aid in checking the pains of non-gouty arthritis.

111 and 112. Abstracted in THE JOURNAL, June 17, 1916, p. 2037.

116. Abstracted in THE JOURNAL, June 24, 1916, p. 2125.

117. **Choice of Tuberculins.**—Until knowledge of the immunity mechanism in tuberculosis is extended and defined, White says, it would seem reasonable that the choice of tuberculins for the treatment of tuberculous infections be restricted to those preparations concerning the use of which we have the fullest information. Based on these considerations the choice would include old tuberculin ("O. T."), bouillon filtrate ("B. F.") and bazillen emulsion ("B. E."). These three meet present theoretical requirements, their selection is justified by experience, and by advocating their use to the exclusion of other preparations the perplexity of the practitioner in planning a program for the treatment of his tuberculous patients would be greatly lessened.

Pennsylvania Medical Journal, Athens

November, XX, No. 2

120 *State Care of Indigent Insane. C. W. Burr, Philadelphia.—p. 79.
121 Workmen's Compensation Law. W. L. Estes, South Bethlehem.—p. 87.
122 Epidemiology and Clinical Features of Infantile Paralysis. C. A. Fife, Philadelphia.—p. 91.
123 Some Phases of Drug Habit Problem, Especially in Relation to Harrison Act. J. H. W. Rhein, Philadelphia.—p. 97.
124 Significance of Specialism with Reference Especially to Genito-Urinary Surgery. B. A. Thomas, Philadelphia.—p. 101.
125 Pathologic Conditions of Mouth of Interest to Physician and Dentist. W. M. Wright, Wilkes-Barre.—p. 105.

120. Abstracted in THE JOURNAL, Oct. 14, 1916, p. 1180.

Washington Medical Annals, D. C.

November, XV, No. 6

126 Roentgenization in Deep-Seated, Benign and Malignant Diseases; Report of Three Cases. C. A. Pfender, Washington.—p. 323.
127 Psychanalysis in Its Relation to Psychiatry. D. P. Hickling, Washington.—p. 336.
128 Dilatation of Left Side of Right Ventricle without Dilatation of Whole Ventricle; Causes and Symptoms. P. S. Roy, Washington.—p. 343.
129 Management of Confusional States with Special Reference to Pathogenesis. T. A. Williams, Washington.—p. 345.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

October, XIII, No. 154

1 *Extensive Fibrosis of Left Ventricle in Child. F. P. Weber.—p. 289.
2 *Treatment of Rickets, Based on New Theory as to Pathogenesis. E. Pritchard.—p. 295.
3 Case of Congenital Urticaria Pigmentosa. G. Pernet.—p. 301.

1. **Extensive Fibrosis of Left Ventricle.**—Weber's patient, a boy, aged 10 years, had melena and considerable enlargement of the heart. In the hospital he frequently had more or less melena, and occasionally there was a little fever. Sometimes he complained of headache. The urine was free from albumin and sugar. There was a history of his having had an illness, accompanied by the passage of blood per rectum, two years previously. Apart from the loss of blood per rectum, the patient had sometimes had, since the illness of two years ago, and during the first part of the present illness, slight hematemesis and slight hemoptysis. Three months later the boy complained of a feeling of painful "stiffness" in the legs and abdomen. There was sometimes slight fever. The urine at first contained albumin, but was afterward reported free from albumin and sugar; no blood could be detected in the feces. At the end of a week he complained of violent pains in the abdomen and lower extremities, chiefly in the right foot and leg. The right foot was at that time very pale and cooler to the touch than the left leg, which showed a "livedo-like" mottling. In seven hours the pallor of the right foot had extended up the leg almost to the groin. Embolism was thought of, but owing to the patient's collapsed condition the pulse test could not be employed, as no pulse could be felt in either lower extremity or at either wrist. Death occurred in half an hour.

The heart weighed 12½ ounces and was both hypertrophied and dilated. The myocardium of much of the outer wall of the left ventricle had been converted into scarlike tissue. There was no valvular disease. The great trunks of the coronary arteries were not stenosed. The abdominal aorta showed great thickening and atheromatous changes in the inner coat (intima), together with some small cell infiltration about the vasa vasorum of the muscular elastic coat (tunica media) and the outer coat (adventitia). At one spot, in which there was an atheromatous deposit, the muscular elastic coat was thin, and bulging outward, to form a kind of miliary aneurysm. Microscopic sections of the fibrotic wall of the left ventricle gave a very striking picture. The small arteries were extremely affected by endarteritis proliferans (obliterans), so that their channels were greatly obstructed, but not altogether obliterated. The fibrous tissue which constituted the greater portion of this part of the cardiac wall contained numerous dilated thin-walled blood vessels (capillaries). There was very little small-cell infiltration to point to any (recent) inflammatory activity. The right common iliac artery was occluded at its bifurcation by recent embolism. Nothing was found in the stomach and intestines to account for the attacks of melena, etc., and no embolism of the mesenteric arteries was detected.

2. **Treatment of Rickets.**—Pritchard suggests that the symptoms usually ascribed to the condition may be regarded as representing the results of the calling into play by the victims of the disease of certain protective mechanisms. The troubles from which they protect the organism in the case of rickets are those which arise in connection with the disposal of an excess of nutritive material. Such disposal may be made as follows: to store up the excess in the form of a food reserve—for instance, as glycogen or fat; combustion or oxidation to the normal end-products carbonic acid gas, urea and water; short circuiting of the oxidation processes. This method has the advantage of saving oxygen and of limiting heat production, but the disadvantage of flooding the blood with acid bodies of large molecular size, such as lactic, oxalic uric, glycuronic, diacetic, beta-oxybutyric and certain other organic acids. Such acid bodies are not allowed to remain in the blood without neutralization, for acid reactions are fatal to cell activities; hence they are neutralized almost before they are formed at the expense of alkalies or basic elements derived from the floating reserves or from the tissue themselves. After neutralization they are removed from the system by the ordinary processes of elimination. In this way the reserves of carbonates in the blood are drawn on, ammonia is extracted from protein sources, while calcium, sodium, magnesium and iron are withdrawn or withheld from various important organic combinations.

In any particular case of rickets, Pritchard states, it is impossible to predict what precise method or combination of methods will be adopted to dispose of the excess, and herein lies the protean character of the symptoms of the disease. But, in the final issue, the metabolic processes will follow the rule of physiologic expediency, obey the laws of the conservation of energy and conform to the economic necessities of supply and demand. Pritchard treats these cases by creating a demand for food by massage, resistance exercises, cold douches and by open-air treatment. The acidosis is treated by the administration of large doses of alkalies: anemia, by carbonate of iron and phosphorated cod liver oil (1 in 10,000). The diet is milk restricted in quantity.

British Journal of Tuberculosis, London

October, X, No. 4

4 *Leukocyte Count in Pulmonary Tuberculosis. J. B. McDougall.—p. 159.
5 Treatment of Tuberculosis in County of Cornwall. C. Roper.—p. 178.
6 Trudeau School of Tuberculosis. E. R. Baldwin.—p. 182.
7 *Classification of Cases of Pulmonary Tuberculosis. H. C. Wingfield.—p. 187.

4. **Leukocyte Count in Tuberculosis.**—One point is definitely established by McDougall, namely, that a distinct "leukocyte swing" is a characteristic feature of certain cases of pulmonary tuberculosis, and that the swing bears a certain relation to the morbid processes going on in the system. McDougall has found the polymorphonuclears to amount to as much as 90 per cent. of the total leukocyte count in certain cases of pulmonary tuberculosis. In early cases the neutrophil leukocytes are frequently decreased in number at the cost of an increase in the number of lymphocytes. There is a remarkable tendency for the leukocyte count to vary enormously in certain cases of tuberculosis of the lung. The absence of leukocytosis excludes cases with cavity formation. The leukocytosis in some cases is certainly associated with the presence of other organisms. It appears as if the leukocyte count bears a definite relationship to the acuteness of the process, and the acuteness of the process, in turn, has a more or less intimate connection with the presence of organisms other than the tubercle bacillus. The low counts represent the stage of hypoleukocytosis, and the high ones the stage of hyperleukocytosis. Whether this phenomenon is anaphylactic or not matters very little; the symptoms displayed by patients with low counts do not correspond to the symptoms shown by patients suffering from anaphylaxis. The patient's condition is absolutely no indication of the leukocyte count. One fact stands out in McDougall's studies and that is, that the polymorphonuclear leukocyte is a tissue cell which is definitely inimical to the great majority of the organisms which infect the respiratory passages secondarily, and to which we can attribute much of the damage done in the pulmonary and bronchial substance. The function of these white cells can be used as a guide to diagnosis, prognosis and treatment.

7. **Classification of Tuberculosis.**—The anatomic extent of the lesion is ignored by Wingfield in his proposed classification. The more important feature of the disease, namely, the constitutional or systemic disturbance, plays the chief part in the classification. This constitutional condition is accurately defined and measured by systematic record of the temperature and pulse rate. For the purpose of statistical records, Wingfield divides cases of pulmonary tuberculosis into four groups; namely, those patients who, during a given period, are (*a*) fit for work and remain so; (*b*) fit for work, but become unfit; (*c*) unfit for work, but become fit for work; (*d*) unfit for work and remain so. He suggests that a useful comparative classification would be to combine this classifica-

tion with an accurate measure of the constitutional condition as found in Inman's classification, and that it could be defined thus.

The condition of a patient suffering from pulmonary tuberculosis (that is, in whose sputum tubercle bacilli have been found) can be denoted at any given period during the course of the disease by one of the following combination of symbols: in_1 = resting febrile; in_2 = resting afebrile, ambulant febrile; in_3 = ambulant afebrile; A = fit for work and remaining so; B = fit for work, becoming unfit; C = unfit for work, becoming fit; D = unfit for work, remaining so.

The dividing line taken between febrile and afebrile is 99 F., the temperature being taken resting, not less than three quarters of an hour after work.

Journal of Tropical Medicine and Hygiene, London

November 1, XIX, No. 21

8 Preliminary Note on Case of Thrush-Like Disease Due to Monilia Rugosa Castellani, 1910. A. Pijper.—p. 249.
9 Treatment of Filariasis and Elephantoid Conditions by Intramuscular Injections of Salvarsan. J. G. McNaughton.—p. 249.

Medical Journal of Australia, Sydney

October 21, II, No. 17

10 Starvation and Diet in Diabetes. J. F. Wilkinson.—p. 335.
11 Systemic Results of Infections of Mouth, Nose and Accessory Sinuses. S. Pern.—p. 340.
12 Case of Recurrent Gallstones. G. A. Syme and S. O. Cowen. —p. 341.

Practitioner, London

November, XCVII, No. 5

13 Treatment of Diabetes by Alimentary Rest. O. Leyton.—p. 401.
14 Treatment of Diabetes Mellitus by Prolonged Fasting. P. J. Cammidge.—p. 414.
15 Treatment of Diabetes Mellitus by Alimentary Rest. J. Hume. —p. 430.
16 Recent Work in Anesthetics. J. Bloomfield.—p. 435.
17 Nitrous Oxid as Anesthetic. E. C. Bowden.—p. 441.
18 Significance of Abortive Cases in Classification of Pulmonary Tuberculosis. E. G. Glover.—p. 454.
19 Minor Displacements of Vertebrae and Ilia. E. F. Cyriax.—p. 464.
20 *Use of Large Quantities of Fruit Juice for Atrophic Infants. H. B. Gladstone.—p. 472.
21 Recent Work on Diseases of Lungs. A. J. Jex-Blake.—p. 479.
22 *Two Cases of Laminectomy for Gunshot Wounds of Spine. G. Simpson.—p. 489.
23 Sublingual Medication; An Endorsement. P. R. Cooper.—p. 493.
24 Obscure Case of Enteric Fever. I. D. Evans.—p. 494.

20. Fruit Juice for Atrophic Infants.—Fruit juice, Gladstone says, can be taken to the extent of a pint daily, with immediate benefit to a dyspeptic atrophic infant under 1 or 2 years of age. A carefully selected food, low in albumin and fat and high in sugar, will then be both digested and absorbed and result in gain of weight. At first a loss of weight must be expected, but, by the end of the first week, this is usually regained. Unless the juice is followed by a diet scientifically adapted to a weak digestion, it does no permanent good whatever. The juice, no doubt, acts partly on account of its acid reaction, rendering the bowel unsuitable for germs growing in an alkaline medium. It has a tonic, cleansing effect on the mucous membrane of the digestive tract, and is a diuretic, diaphoretic and general alterative. It supplies an attractive drink, enjoyed by all babies, containing 10 per cent. of soluble carbohydrate food, removes the irritability and restlessness of the child, promotes quiet sleep, and renders the digestive organs able to digest and absorb a light diet. While oranges were available, the juice was made of two parts of orange juice to one of apple juice, diluted with one quarter the quantity of water; the apple juice was obtained by shredding apples on a vegetable grater, and expressing the juice by means of a fruit press. Melon and apple juice has been used with somewhat less good results. Strawberry, cherry, raspberry and banana juices have been taken and enjoyed by the babies and did not produce any bad effects, and it is probable that any fruit juice available would succeed, provided the acid fruits were not used in too large a proportion, and that when oranges are out of season it will be found advisable to add a small quantity of lemon juice to the sweeter fruit juices, to supply the necessary acidity.

22. Laminectomy for Gunshot Wounds of Spine.—In the first case seen by Simpson a bullet which was pressing on the cervical cord was successfully removed with complete recovery. In the second, a soldier who had received a fragment of shell in the lumbar spine suddenly developed a purulent spinal meningitis three weeks after the injury; the piece of shell was not found, but the spinal theca was drained and the patient made a good recovery.

Bulletin de l'Académie de Médecine, Paris

October 24, LXXVI, No. 42, pp. 307-324

25 *General and Local Anesthesia for the Elderly. P. Bazy.—p. 312.
26 *Massive and Repeated Doses of Antitetanus Serum in Treatment of Established Tetanus. Bacri.—p. 316.
27 Reeducation with Traumatic Deafness by Training with the Vowel Siren. (12 mois de rééducation auditive dans l'armée. Résultats de 250 cas.) Marage.—p. 318.
28 Metal Splint for Fractured Limb Permitting Bending of Joints. (Présentation d'un appareil pour fractures de la cuisse et de la jambe.) V. Soubbotitch.—p. 321.

25. Anesthesia for the Elderly.—Bazy is convinced that the mode of anesthetization has comparatively little influence on the prognosis. He cites instances of elderly men being prepared for an operation who died suddenly before the anesthetic had been brought into the room, and he is confident that many of the fatalities under anesthesia are mere coincidences.

26. Serotherapy of Established Tetanus.—Bacri has given subcutaneously 50 or 60 c.c. of antitetanus serum, repeating this daily for about six days, and all his thirteen patients with tetanus well under way recovered. The modification of the symptoms under these large and repeated doses was remarkable. Only five of the thirteen had been given a preventive injection. No signs of anaphylaxis appeared in any instance.

Journal de Médecine de Bordeaux

October, LXXXVII, No. 12, pp. 229-248

29 Waller's Law and Trophism of Nerves. (La loi de Waller et la théorie du trophisme des nerfs.)— A. Pitres.—p. 231.
30 Paratyphoid Fever and Bacilluria. J. Carles and Marcland.—p. 238.
31 Jacksonian Epilepsy and Hemiparesis from Shell Wound of Skull. Prompt and Remarkable Improvement after Cartilage Implant to Close Gap in Skull. Drouin.—p. 241.
32 *Rhythmical Habit Movements; Two Cases. (Deux cas de rythmie.) Richaud.—p. 243.

32. Habit Movements.—The boy of 6 and his sister of 3 each developed at the age of about 17 months a peculiar habit of balancing themselves, a kind of tic. The boy when put to bed lies in a certain attitude and rolls his entire body to and fro, repeating the whole movement about fifty times a minute till he drops asleep. As he has grown older he lies down on the floor during the waking hours, and rolls in the same way for hours at a time, never wearying. The little girl has three separate habit tics of somewhat the same kind, but her tempo is a little faster. The grandmother is said to have had a similar balancing habit as a child. The father and mother are healthy. Both children seem well developed and healthy, except that the boy has a rather funnel-shaped sternum and the abdomen is prominent. At 2 he had an attack of enteritis.

Lyon Chirurgical, Lyons

September-October, XIII, No. 5, pp. 685-836

33 *Primary Suture of War Wounds. (De la suture primitive immédiate des plaies de guerre.) H. Gaudier and R. Montaz.—p. 685.
34 War Fractures of Long Bones. (Valeur de l'esquillectomie sous-périostée primitive dans le traitement des fractures diaphysaires.) G. Cotte.—p. 698; (Traitement des fractures diaphysaires de la cuisse.) G. Cotte.—p. 719; (Observations sur les fractures diaphysaires des membres dans les plaies de guerre et de l'esquillectomie totale.) Eynard.—p. 750; (Traitement des fractures diaphysaires du fémur dans une ambulance de l'avant.) L. Sencert.—p. 771; (Traitement précoce des fractures de cuisse par blessures de guerre.) J. Bosquette.—p. 791.
35 Wounds of the Hip Joint; Five Cases. (Observations de traumatismes articulaires de la hanche par coup de feu.) P. Bonnet. p. 806.
36 *Shortening the Sound Leg to Match Crippled Leg. (Le raccourcissement du fémur sain dans certains cas de fracture de cuisse avec gros raccourcissement.) J. Ducuing and Uteau.—p. 814.
37 *Transplantation of Nerves. R. Ingebrigtsen (Christiania).—p. 828.

33. Immediate Suture of Wounds.—Gaudier and Montaz advocate immediate suture if the wound gets to the surgeon's

hands early, and can be cleared out completely of all damaged tissues, with perfect hemostasis, and the man can be kept under observation for the first few days. Unless all of these conditions can be realized, they do not attempt to suture at once, but in the more than a thousand cases in which it was possible, the outcome justified their confidence. The first six hours are the best, but they have extended the limit even to twenty-four hours, in some cases, when the aspect of the tissue and microscopic examination of the secretions permitted. The whole area of damaged tissues has to be cut out almost whole, as if it were a tumor.

36. **Treatment of Excessive Shortening of the Leg After Fracture of the Thigh.**—This can be remedied in various ways, of course, but when all else fails or for other reasons it is impossible to correct the crippling by other means, Ducuing and Uteau cure the man of lameness by shortening the sound leg to correspond. They give an illustrated description of the comparatively simple and harmless technic with which they cut out a strip of the lower third of the femur without any loss of its weight-bearing property. They saw each stump half way across and then lengthwise, thus cutting out a segment just the length the limb is to be shortened, and in width just half the diameter of the bone. This leaves the stumps cut in steps which fit solidly together and are held firm by wire passed around them in a "frame suture," *suture en cadre*. The article is illustrated, but no clinical experiences are related except mention of cases in which the war wound resulted in a shortening of the limb by 22 cm. Such crippling as this cannot be remedied by any operation on that leg, but by shortening the sound leg the man would be that much shorter, but his gait would be approximately normal.

37. **Transplantation of Nerves.**—Ingebrigtsen has been experimenting with the rabbit sciatic nerve completely severed from all its connections and implanted in the living rabbit or guinea-pig. He compares the outcome in his experiments with the thirty-two cases of transplanted nerves he has been able to find in the literature. Only two of the cases he has compiled date from the last ten years. The reports cannot be considered strictly scientific except in fourteen of the cases, including one of autoplastic transplanting, three of homoplastic and ten of heteroplastic operations, with one successful outcome in each category. The results in his fifteen autoplastic, twenty-nine homoplastic, and eight heteroplastic transplantations confirmed the assumption that an autoplastic or homoplastic implanted nerve is capable of repairing a loss of substance in a nerve. Fibers from the central stump enter it and it conducts them to the peripheral stump. In this the implant plays an entirely passive part. It seems to be merely a reliable conductor, realizing the best possible conditions both structural and biologic for the growth of the axis-cylinder. Alien grafts do not answer this purpose; they undergo necrosis, and the axis-cylinder cannot push into them. There is also a decided advantage with autoplastic over homoplastic grafts, as the latter show more infiltration and some of the nuclei (*noyaux de Schwann*) are paler and by the end of three weeks are inspisssated. From his experience, Ingebrigtsen suggests that the patient's intercostal nerves would be the best to use for grafting. They are large, while not functionally important, compared to a nerve in a limb. The implant should be about the same size as the nerve it is replacing. The graft can be made to fit the required size by doubling or tripling the segment to be implanted. If the intercostal nerve selected does not afford enough material for this, it might be supplemented by homoplastic segments from another patient, an amputated limb or a fresh cadaver. In his research he kept isolated segments of nerves on ice in petrolatum or in Ringer's solution for five or six days without their undergoing appreciable histologic modification, so that they could then be ingrafted with success. His experiments with "distance sutures," with catgut or silk threads all failed, as also attempts to bridge the gap with a calf artery filled with the animal's own plasma. Five experiments of the latter kind three years ago showed no neoformation of nerve tissue inside the interposed artery tube. The only trace of regeneration was an insignificant formation of a few rolled up nerve fibers at the central stump. His experiences therefore all speak in favor of the advantages of transplanting a nerve segment in appropriate cases. The only method that can compete with it is to anastomose the peripheral stump into a sound nerve, and time will show which of the two methods is preferable.

Paris Médical

November 4, VI, No. 45, pp. 377-420

38 Recent Progress of Ophthalmology. F. Terrien.—p. 377.
39 *Diagnosis and Treatment of Inflammation of Capsule of Tenon. (Ténonites rhumatismales et goutteuses.) A. Terson.—p. 391.
40 Optometry for the Army. (Les centres d'optométrie.) E. Ginestous.—p. 393.
41 Insignificance for Vision of Spots on the Cornea. Rémy.—p. 396.
42 *Blindfold Tests of Functioning of Internal Ear. (Nouvelle méthode d'examen de l'appareil vestibulaire.) M. Grivot and P. Rigaud.—p. 398.
43 Technic for and Experiences with Intratracheal Anesthetization. (De l'anesthésie générale par l'intubation directe intratrachéale.) G. Guisez.—p. 404.
44 Operative Correction of Deformed Nose without Incising the Skin. (Nos corrections chirurgicales de nez disgracieux sans cicatrice. Les nez "de travers.") Bourguet.—p. 410.
45 Systematic Mobilization in Treatment of Constriction of the Jaws. P. Kouindjy.—p. 415.

39. **Inflammation of Capsule of Tenon.**—Terson explains that the fibrous sheath which supports the eye, the retro-ocular capsule of Tenon, is liable to share in the disturbance from rheumatism and gout. It reacts then like a synovial membrane; there is an inflammatory effusion back of the eyeball and movement of the eyeball is painful. In short, the trouble is analogous to the arthritis in acute articular rheumatism. Exacerbations at night suggest a gouty taint. Both eyes usually are affected, but he had one patient with arthritis of the knee who developed this "tenonitis" in one eye alone. Treatment requires some general analgesic to relieve the pain at once, followed by measures addressed to the underlying cause, the rheumatism or gout. Heat is often useful especially in the form of a very hot flax-seed poultice. No constricting bandages and no dressing in the intervals between the poultices, merely automobile goggles for protection. Few affections respond so promptly and effectually to nonspecialist treatment as this to the salicylates. It is differentiated by the absence of fever, the non-impairment of vision and the normal findings in the fundus. Even if there is slight congestion in the veins of the optic nerve and slight fever, the diagnosis is generally easy. There is no suppuration in this true tenonitis of rheumatismal or gouty origin, but in exceptional cases the exophthalmos may persist for months and suggest syphilitic hyperplasia, etc. With all other ocular affections which might be compared with it, there is more or less impairment of vision and usually much fever. Acute edema of the bulbar conjunctiva is not accompanied by pain as a rule. When this acute edema occurs inside the eyeball, we have the clinical picture of acute glaucoma.

42. **Testing Vestibular Functioning.**—Grivot and Rigaud report the results of study of the pathologic deviation to the right or left when the patient with disease of the internal ear and blindfolded walks 6 meters forward and then backward. His inability to do this on a straight line is increased by stimulation applied to the vestibule, as for inducing test nystagmus. The locomotor reaction to stimulus applied to the vestibule—as by pouring cold water into the ear—seems to be of the same nature as the nystagmus reactions. By the deviation to one side in five, six or ten of the forward and back movements, we have an index of vestibular functioning. For example, if there is a deviation to the right of 90 degrees in the course of five of the movements, they express this as "5 M deviates 90 plus"; if ten of the movements brings a deviation of 90 degrees to the left, they express this as "10 M deviates 90 minus." They explain the mechanism for this reaction to the cold stimulus applied to one vestibule, comparing the normal with the pathologic responses both in man and in frogs, with eight diagrams and some typical case reports. The locomotor reaction is the generalization of a reflex syndrome characterized, in its first phase, by the oculomotor, nystagmus reaction, but the locomotor reaction is an amplification easier to follow and record.

Presse Médicale, Paris

October 26, XXIV, No. 60, pp. 481-488

46 **Devices for Continuous Elastic Tension to Correct Vicious Attitudes of the Limbs.** (La tension élastique continue pour le redressement des attitudes vicieuses des membres.) F. Jayle, P. Bacquelin and T. Dubé.—p. 481.

47 Amebic Dysentery. A. Mauté.—p. 483.

November 2, No. 61, pp. 489-496

48 *Acute Nephritis in the Troops on Active Service. (Les néphrites aigues azotémiques des troupes en campagne.) P. Ameuille.—p. 489.

49 War Wounds of the Knee. (Sur le traitement des plaies de guerre du genou.) A. Moulonguet.)—p. 491.

50 *Treatment of Vincent's Angina and Stomatitis with Silver Nitrate and Methylene Blue. (Stomatites et angines fuso-spirillaires.) M. Favre and H. Dreyfouss.—p. 492.

48. Soldiers' Acute Nephritis.—Ameuille emphasizes that the acute nephritis encountered so often in the troops at the front may be of two types, nephritis with anasarca or nephritis with azotemia. "This latter type has not been described," he says, "as, outside of France, comparatively little attention is paid to the urea content of the blood in estimation of kidney disease, and even in France few have applied it to soldiers' nephritis." The uremic form is liable to come on with jaundice, meningeal symptoms, delirium and convulsions, with fever and more or less albuminuria but no edema. Or the disease may commence with infectious sore throat, acute enteritis or generalized ecthyma. The temperature runs up more rapidly than with typhoid, and the fluctuations are more pronounced. The case is generally labeled at first grippe or febrile stomach trouble. The urine is scanty, with much albumin, more or less blood and up to 2 gm. of urea or more. If the urea in the urine subsides as the content of the blood increases, a fatal outcome is inevitable. The disease runs its course in two weeks on an average, but the range is from death or recovery in a few days to a very protracted course. Considerable weakness afterward is the rule, but recovery seems to be complete at last. In two cases reported there was acute azotemia but no fever and no albuminuria. Delirium was the predominating symptom in the first case, and convulsions in the other. The azotemia is the predominating factor, and necropsy explains this by the changes found in the kidneys. They differ from the classic lesions of acute nephritis, as he describes. They seem to be nodular lesions from acute interstitial inflammation, scattered through a kidney with traces of old but very slight chronic changes. Recent inflammatory lesions of much less extent and severity are found at times in some of the other organs, testifying to a general infection acting on abnormally frail kidneys. Trench warfare seems to have a particularly injurious influence on the kidneys.

50. Treatment of Vincent's Angina and Stomatitis.—All manifestations of fusospirilla infection seem to yield most readily to thorough cleansing out of the ulcerations with 10 per cent. silver nitrate, following with a 1 per cent. methylene blue solution. At least this has been the outcome in the experiences related. The applications are repeated daily; the main point is the cleaning out to the bottom of each of the ulcerations.

Progrès Médical, Paris

October 20, XXXI, No. 20, pp. 193-202

51 Arthrotomy of the Knee for War Wounds. (Notes sur l'arthrotomie du genou.) Bérard.—p. 193.

52 Effects on Nervous System from Explosion Nearby. (Caractères essentiels de la commotion cérébro-spinale.) Bonhomme and Nordmann.—p. 194.

53 Cesarean Section by Fragment of Shell. (A propos d'une césarienne par éclat d'obus.) Saint, Goehlinger and Poiré.—p. 196.

54 Bridged Plaster Casts. (Les appareils plâtrés avec arceaux.) J. Regnault.—p. 198.

55 Reeducation of the Blinded Soldier. (La première éducation du soldat aveugle.) E. Ginestous and C. Dominique.—p. 199.

Revue Médicale de la Suisse Romande, Geneva

October, XXXVI, No. 10, pp. 625-676

56 *Epidemic of Scalp Disease. (Une épidémie de teigne à petites spores chez des écoliers.) E. de Keynier.—p. 625.

57 *Thyroid Grafts Do Not Require Nerve Connection. (La dénervation du greffon thyroïdien en compromet-elle la sécrétion interne?) E. Kummer.—p. 636.

58 The Tuberculin Skin Test for Schoolchildren. (A propos du Pirquet dans les écoles de Lausanne.) L. Jeanneret.—p. 643.

59 *Skin "Typhine" Tests and Skin "Diphtherine" Tests for Typhoid and for Diphtheria in Young Children. (Du diagnostic de la fièvre typhoïde et de la diphthérie en médecine infantile.) L. Jeanneret.—p. 652.

60 Tuberculosis and the Tropical Sun. (Tuberculose et soleil tropical.) L. Steiner.—p. 653.

56. Microsporon Scalp Disease.—De Reynier relates that he found the microsporon in ninety-eight of the 144 children he examined; eleven had the trichophyton besides. He says that, untreated, this form of tinea tonsurans may keep up for years, but it subsides spontaneously at puberty. The cure is complete and permanent. The first signs of trouble were a gray patch in the hair and the falling out of the hair. As soon as the epidemic at Neuchâtel was noted, stringent measures were taken by the authorities to arrest the further spread. General practitioners were called on to assist the medical school inspector, and every child with any symptom of scalp disease was forbidden to attend school and was sent to a special polyclinic organized for the purpose. The city authorities notified all the shops selling hats of the prevalence of the tinea, and ordered that squares of tissue paper should be offered to customers so that a square could be laid over the head before trying on a hat, the paper to be burnt afterward. Strict prophylactic hygiene was enforced in the barber shops. The back of the chair had to be protected with a fresh paper or cloth napkin for each customer, and the scissors and metal combs singed in the flame after using on a customer, razors washed in 70 per cent. alcohol, brushes and other combs, etc., placed in a formaldehyd sterilizer for two hours. Besides this, all the combs and brushes had to be carefully washed once a day, at least, with a 2 per cent. solution of soda. The use of cakes of soap for the beard and alum pencils, of revolving brushes and of powder puffs was prohibited. The powder had to be blown on with a rubber bulb or applied with a wad of cotton, destroyed after each use. No wigs were allowed to be rented except with a fresh inner cap each time. These and the other regulations had to be posted in plain view in each barber shop and hair-dressing parlor.

The school authorities arranged for a special school for the tinea children and another school for their brothers and sisters. The diagnosis once made, the hair was cut close and the head washed with a 20 per cent. alcoholic solution of iodin. It was then covered with a hood of absorbent gauze and tarletan held in place by a strap under the chin. The children were then exposed to the Roentgen rays and after this returned twice a week to have the scalp rubbed vigorously with cotton dipped in the 5:95 alcoholic solution of iodin. After waiting a minute, the hood of gauze and tarletan is applied anew, arranged so that it cannot be taken off day or night. This is for the protection of others. The hairs fall out by the third week after the Roentgen exposure. Washing the head with soft soap hastens the depilation. This is the time to attack the spores in the follicles most vigorously with the iodin rubs, while the follicles are still empty, before the new hairs sprout. This treatment has to be kept up for two or three months. If microscopic examinations and cultures are still negative, the child is regarded as cured and can discard his hood. All his caps, etc., used during the course of treatment are burned, and the pillows and bedding sent to be sterilized. If the findings are still positive, a second Roentgen exposure is made and the whole course repeated. The children were of all classes of society, including some who had always had the best of hygienic care. The whole scalp was exposed to the Roentgen rays at a distance of 15 cm.; the dose 10 X or 5 H units at each of the five or six areas exposed, the whole sitting taking from forty minutes to an hour. No by-effects were ever observed, not even in the twenty-six cases requiring a second exposure. The epidemic was thus stamped out completely in the course of the year.

57. Thyroid Grafting.—Kummer removed the thyroid and parathyroids completely or partially and grafted one or two lobes at once in a pocket in the omentum or elsewhere. This was done on five dogs and three cats to determine whether

the lack of any innervation of the graft interfered with its functioning. The grafts healed in place and evidently provided the necessary internal secretion, keeping the animals well, although not connected with the nervous system.

59. **Skin Differential Test for Typhoid and Diphtheria.**—Jeanneret makes a "typhin," from typhoid bacilli, like the tuberculin from tubercle bacilli, and states that an intradermal injection elicits a specific local reaction like the Mantoux tuberculin test. He also uses in the same way a "diphtherin" made from a glycerin extract of cultures of diphtheria bacilli. In diagnosis in puzzling cases in children these might prove useful. He adds that the same principle might be applied in pneumonia, meningitis, etc.

Correspondenz-Blatt für Schweizer Aerzte, Basel

October 28, XLVI, No. 44, pp. 1473-1504

61 *Streptococcus Viridans Chronic Sepsis. (Ueber Sepsis lenta.) P. Deus.—p. 1473.

62 Ultraviolet Rays with Exceptionally Short Waves Produced by the Simpson Arc Lamp. (Les Rayons Simpson.) F. M. Messerli. —p. 1487. Briefly described in THE JOURNAL, Feb. 26, 1916, p. 537.

61. **Sepsis Lenta.**—Deus reports the clinical and necropsy findings in a typical case of chronic endocarditis for which the *Streptococcus viridans* was unmistakably responsible. It is evident from the history of this type of sepsis that special circumstances and general depression of the vitality from some cause are necessary before this germ is able to proliferate in the blood. Deus' patient was a healthy farmer free from pathologic antecedents until eighteen months before, while on military service, he noticed lassitude and considerable loss of weight. Six months later he developed pleurisy which recurred again and again, notwithstanding repeated punctures. Ascites developed later, and the man died from heart symptoms and dyspnea a year and a half after the first signs of trouble. The temperature and pulse were seldom and only briefly above normal. The spleen was much enlarged. The red count was normal, whites 12,000, with eosinophilia up to 65 per cent. The urine early indicated pathologic conditions in the kidneys. The necropsy findings were those typical of Schottmüllers sepsis lenta, except that the heart valves seemed to be intact while there were extensive fibrous adhesions and thrombosis in both ventricles.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 22, XXXVII, No. 85, pp. 1329-1344

63 *The Refractometric Index in Typhoid. (Osservazioni refrattometriche nella infezione tifoide.) C. B. Farmachidis.—p. 1332.

October 26, No. 86, pp. 1345-1360

64 Treatment of Frozen Feet. (La termo-foto-cromo terapia delle congelazioni di 3. grado nei soldati.) A. Secchieri.—p. 1349.

63. **Refractometric Index of Blood Serum in Typhoid.**—Farmachidis found in twenty cases of typhoid that the refractometer findings in the blood serum rose as the temperature declined in the medium and light cases. In the severe cases, however, the refractometer index fluctuated, displaying a tendency to drop as the general condition grew worse, irrespective of the temperature. It rose as the patient improved. He tabulates the findings in his twenty patients at two or three days' intervals throughout the course of the disease, recording simultaneously likewise the coagulating time of the blood, agglutination and temperature.

Policlinico, Rome

October 29, XXIII, No. 44, pp. 1271-1298

65 *Crippling Operations in Wartime. (Intorno alle mutilazioni in tempo di guerra.) G. Cavina.—p. 1271.

66 *Epidemic Cerebrospinal Meningitis. U. P. Gavelli.—p. 1276; (Meningite cerebro-spinale epidemica a inizio morbiliforme.) A. Bolaffi.—p. 1279.

October, Surgical Section No. 10, pp. 289-320

67 Catheterization of the Ureters. E. Pirondini.—p. 289. Continuation.

68 Tuberculous Processes in the Tongue. (La tubercolosi della lingua.) L. Durante.—p. 302.

69 Hard Duodenal Ulcer. (Ulcera duodenale callosa.) F. Saraceni. —p. 318.

65. **Crippling Operations in Wartime.**—One paragraph in this article reads literally: "Of the (*censored*) sick and wounded received at our field hospital from the beginning of the war to date, of whom (*censored*) were wounded and (*censored*) had frozen feet, only fifty-two amputations have been done including six partial amputations of the foot." The mortality in the amputation cases was 32 per cent. but 53 per cent. died of the twenty-six requiring amputation of the thigh. He ascribes this high mortality to the overlong expectant treatment. The amputation was decided on too late.

66. **Epidemic Meningitis.**—Gavelli relates that among the men sent to the hospital under the mistaken diagnosis of meningitis, were three with acute angiocholitis, one with acute nephritis and one with septic endocarditis. These men were totally unconscious when admitted, but lumbar puncture released limpid fluid although under high pressure. The fluid was always turbid in the meningitis cases, whether the meningococcus or other germs were responsible for it. The mortality was 75 per cent. in the meningitis cases in which less than 30 c.c. of antiserum had been injected at a dose, and only 28 per cent. when the doses had been higher than this. The serotherapy invariably mitigated the disease and relieved the symptoms. In contrast to what was observed in the serum-treated cases, he describes the tedious course of the disease in one man for whom it was impossible to provide serotherapy. His headache and other symptoms were terrible for five weeks, not yielding to any other measures.

Bolaffi reports a case in which meningococcus septicemia produced a syndrome deceptively like measles, including an eruption, cough and dyspnea. But the patient complained of severe pains in the limbs and headache, and the eruption did not appear on the back. Meningococci were cultivated from the blood and spinal fluid, and unmistakable symptoms of meningitis soon followed. He has had other patients whose first symptom from meningitis was sudden intense pain in one arm. In others, pains in the legs or joints were the primary symptoms.

Brazil-Medico, Rio de Janeiro

September 23, XXX, No. 39, pp. 305-312

70 *Direct Abdominal Pain in Women. (Semiologia da dor abdominal direita na mulher. III.) R. Vaz.—p. 305. Commenced in No. 37, p. 289.

October 7, No. 41, pp. 321-328

71 Intravenous Iodin and Salicylate Medication. A. A. da Matta. —p. 321. Concluded in No. 42.

72 Hyperemesis Determined by Trichocephalosis. R. da Silya.—p. 323.

70. **Pain in the Kidney Region.**—Vaz concludes his long study of direct abdominal pain in women with a discussion of the pain for which the kidney is responsible. This forms a large proportion of the cases of pain in the abdomen, at the front or back, and downward displacement or concretions in the kidney are the most frequent causes of direct pain in this region. The pain is liable to spread to the anterior abdominal wall, to the inguinal region, the labia majora, the upper part of the thigh, and even to the feet. Besides the local spontaneous pain and the radiating pains, there are tender points in the anterior, lateral and posterior portions of the abdomen. With ptosis, there may be paroxysms of pain besides, accompanied by nausea, vomiting and nervous and dyspeptic conditions, known as Dietl's crises. Renal colic may occur not only with kidney stones but when a fragment of necrotic tissue gets into the ureter or exudation occurs.

Revista de la Asociacion Medica Argentina, Buenos Aires

September, XXV, No. 142, pp. 231-340

73 *Goiter in Girl of Five. (Bocio nodular en una niña de 5 años.) J. M. Jorge.—p. 231.

74 *The Bile-Pancreatic Juice Reflux and Its Importance for the Diagnosis of Duodenal Ulcer. (El reflujo bilio-pancreatico.) C. B. Udaondo.—p. 245.

75 The Pathogenesis of Strabismus. R. Argañaraz.—p. 252.

76 Hemophilia in Girl of Sixteen. (Hemofilia femenina.) M. R. Castex.—p. 275.

77 Tuberculosis in Argentine Navy. (La tuberculosis en la armada.) J. G. del Castillo.—p. 285.

78 Present Status of the Cancer Problem. M. Beatti.—p. 328.

73. **Large Goiter in Small Girl.**—The goiter was successfully removed. It had developed in the course of ten months, and the microscope showed that there were two distinct histologic processes in the thyroid. One part of the thyroid tumor was of embryonal character, while the larger part was of the ordinary follicular goiter type in adults.

74. Reflux of Bile and Pancreatic Juice with Duodenal Ulcer.—Udaondo reports that this occurred spontaneously in 84.5 per cent. of his 13 cases of ulcer in the upper duodenum and in 44.4 per cent. of 8 in the second segment of the duodenum, while there was no spontaneous reflux in 88.8 per cent. of 27 cases of gastric ulcer on or near the pylorus, and in 87.5 per cent. of 32 cases of gastric ulcer remote from the pylorus. In another series of tests he induced by the Volhard method excessive secretion of duodenal juice, and tested the stomach content for trypsin by the Gross method. Under these conditions a reflux was found in 99.9 per cent. of 11 high duodenal ulcers and in 87.5 per cent. of 8 lower down. Also in 8.3 per cent. of 12 gastric ulcers on or near the pylorus, and in 33.3 per cent. of 12 remote from the pylorus. Udaondo noticed further that the proportion of trypsin was always abnormally low in the reflux when the duodenal ulcer was located in the second part of the duodenum. [The Volhard method was described in THE JOURNAL, 1915, lxv, 1390.]

Siglo Medico, Madrid

October 7, LXIII, No. 3278, pp. 641-656

79 *Treatment of Itching Affections. (Pruritos generalizados y localizados.) E. de Oyarzabal.—p. 642.

79. Treatment of Pruritus.—Oyarzabal discusses essential pruritus, the skin intact except from having been scratched. He gives a number of formulas for local treatment and says that the diet and bowels should be regulated whatever the cause of the pruritus. The clothing and room should be cool. The source of the toxins responsible for the pruritus should be sought, the functioning of the liver, kidneys and bowels should be examined. Menstrual disturbances or uterine lesions may be the cause or hypertrophy of the prostate, gout, diabetes, blood diseases, drug addiction, neurasthenia, hysteria, emotional stress or incipient general paresis or tabes. The mercury vapor quartz lamp or the Roentgen rays have frequently succeeded when all else failed, but local treatment of generalized pruritus, especially of the senile, offers little promise of success. When nothing else benefited, he has sometimes obtained good results from venesection followed by injection of saline, withdrawing from 150 to 300 c.c. of blood and injecting a pint or two or more of saline, utilizing the same cannula. Linser's method of treating the toxic dermatoses of pregnancy with normal serum can be applied to many itching skin affections and diffuse pruritus. For this he draws 50 c.c. of blood from a healthy donor, centrifugates for five minutes with glass beads and then centrifugates the serum anew and injects 10 or 30 c.c. subcutaneously, repeating this on three, four or five successive days and again after a few days' suspension.

Grèce Médicale, Athens

XVIII, No. 13-14, pp. 25-28. French Supplement to Iatrike Proodos

80 *Ischemic Contracture. (De la rétraction musculaire ischémique de Volkmann.) N. Alivisatos and S. N. Oeconomos.—p. 25. Commenced in No. 11, p. 21.

80. Volkmann's Ischemic Retraction.—Alivisatos and Oeconomos relate that, with an unpublished case of their own, they now have records of 144 cases of this affection. According to Berger only four cases in adults have been published; the majority of cases were in children of 3 or 4. But Denucé states that in fully 15 per cent. of the cases adults were involved. He adds that pressure from a plaster cast was responsible in 79 per cent. of the cases. In the others, a tourniquet or ligation of an artery or hematoma from contusion or a simple fracture was incriminated. The arm is usually affected, but the trouble may develop in the leg after freezing or embolism, or even a gunshot wound as in the personal case mentioned. The pathologic anatomy, pathogenesis and the medicolegal questions that may arise are discussed in turn, with several illustrations of their personally observed case. Always after applying a plaster dressing, it should be carefully examined an hour afterward and again twenty-four hours later. If there are spontaneous pains, or if the hand looks purplish or pale, or the fingers are numb or cannot be moved, the plaster should be removed and the arm held straight up in the air or kept in hot water or hot air, the fingers exercised passively and actively, and the arm massaged throughout. If direct surveillance is not possible, the family should be instructed to watch out for any of these symptoms. The correction of the deformity seems to be attained best by gradual elastic traction, according to Martin's principles, but a long list is given of measures that have been applied with more or less success.

Russkiy Vrach, Petrograd

XV, No. 39, pp. 913-936

81 E. E. Metchnikoff, 1845-1916. V. I. Nedrigailoff.—p. 913.
82 Arteriovenous Aneurysm. V. N. Savvin.—p. 915.
83 Impotence as Ground for Divorce. (Eshtshe o "nesposobnosti k brachnomu sozhitiiu.") D. P. Kosorotoff.—p. 916.
84 Obliteration by Actual Cautery of Bleeding Varicose Vein in Bladder. (Varices venarum mochevogo puzirya kak prichina krovetecheniya iz nego.) G. I. Baradulin.—p. 919.
85 *Experimental Research on Heterogeneous Anaphylaxis. (K ucheniu o geterogennikh protivutielakh.) I. L. Krichevsky.—p. 920.
86 Sterilizers for Army Use. (Ob autoklavakh dlya armii.) A. A. Grube.—p. 923.
87 *Benzol in Treatment of Leukemia. (K liecheniu bielokroviya benzolom.) E. K. Krol.—p. 927.

85. Heterogeneous Anaphylaxis.—Krichevsky comments on the way in which the former conception of the specificity of antibodies has been rendered untenable by recent research. This has shown that hemolysins against sheep red blood corpuscles can be obtained by immunizing animals not only with the organs of animals far higher or lower in the animal kingdom, but also with their red blood corpuscles. He relates extensive experiments with rabbits immunized by means of sheep and hen corpuscles. He obtained, in this way not only hemolysins against the red corpuscles of the entire alien species—heterogeneous hemolysins as Friedberger calls them—but also heterogeneous anaphylactic antibodies. By immunizing rabbits with hen corpuscles, not only hemolysins against sheep red corpuscles were elaborated but also heterogeneous anaphylactic antibodies, as is shown in the tabulated details from twenty-three rabbits. Most of the rabbits were subjected to a twofold sensitization with hens' red blood corpuscles, rinsed from the blood serum. After a definite time the test for anaphylaxis was applied with sheep red corpuscles introduced into a vein in the ear. He also at the same time determined the titer of the hemolysins against sheep red corpuscles. Of the twenty-three rabbits sensitized with hen red corpuscles, twelve died from anaphylaxis or presented the typical syndrome of anaphylaxis such as is observed after the intravenous injection of sheep red corpuscles. Acute anaphylactic shock was observed in six of the animals. If the animal dies in a few hours after the anaphylactic test, then death occurs in increasing coma. Otherwise the rabbits seem to be apparently entirely well or else they exhibit extreme weakness and in the majority of the cases the extremities become paralyzed and the animal lies stretched out like a seal, with progressive prostration and reduction of temperature. Sometimes death is preceded by general convulsions, exactly like those of anaphylactic shock. Some think that the sensitization of the animal, as well as the anaphylactic shock, are dependent not on the red corpuscles but on the traces of the serum still clinging to the washed corpuscles. The tests reported here, however, confirm the possibility of anaphylaxis from cells as he describes. The heterogeneous anaphylaxis was observed always in the animals with heterogeneous hemolysins, and in the majority of cases the anaphylactic phenomena were directly proportionate to the hemolytic titer. Krichevsky discusses the various theories on anaphylaxis under different circumstances, but is inclined, himself, to regard the hemolysins and the anaphylaxis antibodies as identical. The hemolysins act in vitro and the others only in the living body.

Eleven of the rabbits did not develop anaphylaxis. These were the ones with low hemolysis titer. "From my point of view," he says, "the absence of anaphylaxis under the conditions of the tests with sheep red corpuscles was completely to be expected. The small quantity of antibodies was too insignificant to induce anaphylactic manifestations. That this explanation is correct is demonstrated by the results of some supplementary tests undertaken to confirm it." He describes the supplementary tests also in tabulated form, two of the

four rabbits dying in three and in six minutes, the others recovering after a brief anaphylactic shock.

87. **Benzol in Leukemia.**—Krol reports the details of a case of leukemia in a little girl of 10 whom he treated with benzol, Roentgen exposures and subcutaneous injections of arsenic. Her sickness dated from two and a half years before, when her parents noticed that her abdomen was protruding. Under two months of the combined treatment mentioned the whites dropped from 325,000 to 77,000, the spleen became much reduced in size, and the child seemed immeasurably improved in every respect. A letter from the parents five months later related that all was well with the child. There had been no aggravation during this period.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

October 21, II, No. 17, pp. 1453-1532

88 *The Task of the Medical Teacher. VII. (Een en ander over hooger onderwijs in de geneeskunde. VII.) G. van Rijnberk.—p. 1453.
89 *Milk Diet in Chronic Nephritis. (Eenige mededeelingen over melkdieet bij slepende nierziekte.) D. G. C. Tervaert and E. H. B. van Lier.—p. 1457.
90 Research on the Tonicity of Muscles and the Innervation Therefor. (Onderzoekingen over spiertonus en spiertonusinnervatie. I.) G. van Rijnberk.—p. 1470.
91 Nodose Rheumatism; Two Cases. L. P. Daniels.—p. 1473.
92 Boerhaave's Pupils. (Boerhaaviana. I). E. C. van Leersum.—p. 1480.
93 Case of Spontaneous Healing of Ruptured Spleen. (Geval van spontaan genezen miltverscheuring.) A. Verhagen.—p. 1491.

88. **The Task of the Medical Teacher.**—Van Rijnberk remarks that every one knows that the university is an institution where a young man can buy knowledge. The professors are the persons who possess this knowledge and impart it to the young men. But how did the professors get their knowledge? By studying. But when one asks what is meant by this term "studying," then confusion begins. For the medical teacher, at least, it is plain that study of books is not all. He continues, "A well known physician told me once that he had learned much from his professors, more from other practitioners, but most of all from his assistants. Books and intercourse with others are valuable, but the highest form of studying a subject is to investigate Nature and test for oneself. Only insight obtained through one's own work can render teaching vital and fruitful. No criticisms nor self-criticism nor plastered-on knowledge can compare in effectualness to that obtained by personal research. Another reason for the latter is that scientific research is one of the few occupations that bring inward poise and satisfaction. The students should be offered the opportunity to enter this field, and this can scarcely be done unless the teacher leads the way. Besides this, the taking part in labors behind the screen at the clinics and laboratories affords opportunities for intimate intercourse with the better class of the students, giving them thus the finishing touch." . . . "This attracting of the more interested among the students into the inner circles of the laboratories and clinics has the further advantage that it aids in forming the medical teachers of the future." He says that in his country (Netherlands) there is great lack of minor lecturerships and other opportunities for self-support of research workers. Other countries have arrangements which are like a nursery of young trees growing up to take the place of the older ones. In his country it is a very difficult matter to find a suitable incumbent when a scientific chair becomes vacant. Where there is opportunity for research work, the workers mutually stimulate each other, giving, taking and emulating each other. Where the authorities are too economical or too conservative to foster scientific research there is none of this expansion. In conclusion he says, "And this is the most exalted part of the task of the medical teacher. To detect in the crowds of students passing before him the one capable of being inspired with the love of science, to foster this and give it opportunity to bud, to foster his loyalty to his school, to his family, to all the schools of the land, and beyond its borders to feel his connection with others all the world around who with zeal and sacrifice are working for scientific aims rather than for money and ease."

89. **Milk Diet in Chronic Kidney Disease.**—The experiments and the ten clinical experiences related have apparently demonstrated that the albumin in milk is just as injurious in kidney disease as albumin from any other source. Hence restriction to a milk diet in case of nephritis with retention of urea is decidedly harmful. Excessive retention of urea, as determined by Ambard's formula, indicates a grave prognosis. If the patient is put on a milk diet, it is rendered still graver. In two of the cases of mild uremia described, the symptoms of uremia subsided when milk was forbidden. In nephritis without edema—and these are mainly the cases with retention of nitrogen—milk should be allowed only very cautiously, if at all, unless retention of nitrogen can be positively excluded.

Ugeskrift for Læger, Copenhagen

October 26, LXXVIII, No. 43, pp. 1899-1930

94 Irregular Pulse with Exophthalmic Goiter. (Om Pulsarytmi ved Morbus Basedowii.) L. S. Fridericia.—p. 1899.
95 *Case of Acute Hemorrhagic Pancreatitis. S. A. Gammeltoft.—p. 1908.

95. **Acute Pancreatitis.**—The patient was a healthy woman of 25 taken suddenly with severe pains in the abdomen, mostly in the right lumbar region, with some fever and vomiting. The presumptive diagnosis wavered between appendicitis and pyelitis until a bulging above the crest of the right ilium seemed to indicate an abscess. An incision revealed only an accumulation of old sterile blood, no clots. After a brief period of improvement, the symptoms returned in an aggravated form, but no cause for them or the hemorrhage could be discovered. Her temperature was high each afternoon, with morning remissions, the right kidney region more and more tender, but catheterization of both ureters showed only normal conditions. Thirty-two days after the first sign of trouble, the original incision was carried back into the right lumbar region and here large masses of necrotic fat tissue were found. They extended up to the kidney, but this organ seemed to be sound. As much as possible of the gangrenous and putrid fat tissue was removed, and the cavity drained. The patient began to recuperate at once and recovery was soon complete. The only complication was parotitis on the left side. The retrospective diagnosis was thus acute hemorrhagic pancreatitis with the extravasated blood and the necrotic fat tissue sliding down into the right iliac fossa. All the symptoms were restricted to the right side, which is most unusual with pancreas disease. Neither Körte nor Giordano mentioned such a case in their compilations for the third international surgical congress, although the latter mentioned one case in which the necrotic tissue was found in the left iliac fossa. In the personal case here described the patient felt sick and the tongue was parched but the mind kept clear and the pulse regular and strong. The mortality is high for operations during the first acute phase, and the case here reported seems to testify in favor of expectant treatment at first.

Upsala Läkareförenings Förhandlingar

XXI, No. 8, pp. 581-658. Last indexed Dec. 9, p. 1798

96 Trichobczoar in the Stomach. G. von Holst.—p. 581.
97 Internal Hernia; Two Cases. (Två fall af inre bråck.) G. von Holst.—p. 583.
98 *Cancer of the Appendix and Cecum. G. von Holst.—p. 586.
99 *Removal of Large Myoma during Pregnancy. G. von Holst.—p. 589.
100 The Organization of the Medical Department of the German Army. (Några erfarenheter om tysk krigssjukvård.) S. Lindqvist.—p. 592.
101 Biology and Statistics. G. Backman;—p. 609; (Några ord om användandet af siffervärden inom biologien.) P. Häggström.—p. 644.

98. **Cancer in the Appendix.**—A woman of 57 had the appendix removed for gangrenous perforation. Two years later, during an operation for hernia, a small tumor was found in the cecum in the appendix region. It proved to be of malignant character, and examination of the appendix which had been removed two years before showed cancer cells in it of the same type as in the cecum cancer. She has been in comparatively good health since its excision.

99. **Myomectomy During Pregnancy.**—The pregnancy was at the seventh month but it progressed to term, apparently not affected by removal of a myoma weighing 1.25 kg., growing on the fundus of the uterus.